

Bibliography Section

Liquid Column Chromatography

1. REVIEWS AND BOOKS

- 1 Dorsey, J.G. and Cooper, W.T.: Retention mechanisms of bonded phase liquid chromatography. *Anal. Chem.*, 66 (1994) 857A-867A - a review with 52 refs.
- 2 Krull, I.S., Deyl, Z. and Lingeman, H.: General strategies and selection of derivatization reactions for liquid chromatography and capillary electrophoresis. *J. Chromatogr. B*, 659 (1994) 1-17 - a review with 175 refs.
- 3 Larionov, O.G. (Editor): *Proceedings of the 2nd International Symposium on Surface Chemistry, Adsorption and Chromatography, Moscow, 29 June-3 July 1992*, IUPAC Commission, Blackwell, Oxford, 1993, 146 p.; C.A., 121 (1994) 43806b.
- 4 Laubsher, J.C.: (Optimization of chromatography). *Schweiz. Lab.-Z.*, 51 (1994) 200-203; C.A., 121 (1994) 124318w - a review without refs.
- 5 Michalitz, M.: (Ion chromatography). *Ber. Forschungszent. Juelich*, JUEL-2867 (1994) 35-44; C.A., 121 (1994) 124062h - a review with 1 ref.
- 6 Revillon, A.: Alternatives to size exclusion chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2991-3023 - a review with 71 refs.
- 7 Simpson, J.M.: Conventional chromatography. *Bioprocess Technol.*, 18(Protein Purification Process Engineering) (1994) 209-258; C.A., 121 (1994) 174119c - a review with 98 refs.
- 8 Viovy, J.L. and Lesec, J.: Separation of macromolecules in gels: permeation chromatography and electrophoresis. *Adv. Polym. Sci.*, 114(Polymer Analysis and Characterization) (1994) 1-41; C.A., 121 (1994) 199812m - a review with 186 refs.
- 9 Yu, H. and Yang, S.: (Review of astragaloside analytical methods). *Huaxi Yaoxue Zazhi*, 8 (1993) 163-166; C.A., 121 (1994) 164076x.
- 10 Zhang, Z., Yang, M.J. and Pawliszyn, J.: Solid-phase microextraction. *Anal. Chem.*, 66 (1994) 844A-853A - a review with 28 refs.

See also 11, 42, 60, 65, 75, 93, 97, 102, 135, 137, 144, 145, 146, 157, 159, 194, 203, 228, 229, 242, 323, 348, 361, 426, 429, 442, 472, 687, 881, 907, 912, 981, 1051, 1206, 1222, 1224, 1241, 1242, 1248, 1254, 1275.

2. FUNDAMENTALS, THEORY AND GENERAL

- 2a. General
- 11 Adner, N. and Sofer, G.: Biotechnology product validation, part 3: chromatography cleaning validation. *BioPharm (Eugene)*, 7 (1994) 44-48; C.A., 121 (1994) 77507v - a review with 13 refs.
- 12 Ammons, R.L.M.: Mathematical control theory for liquid chromatography. Avail. *Univ. Microfilms Int.*, Order No. DA9316829, 1992, 202 p.; C.A., 121 (1994) 43638y.
- 13 Bazylak, G. and Maslowska, J.: (The importance of association processes for physicochemical description of selectivity of chromatographic systems). *Zesz. Nauk.-Politech. Lodz., Technol. Chem. Spozyw.*, 648 (1993) 53-83; C.A., 121 (1994) 164504k.
- 14 Busch, K.L.: Cost analysis of determinations with planar chromatography and column chromatography. *J. Planar Chromatogr.*, 7 (1994) 318-321.
- 15 Bussemans, H.H. and Ette, L.S.: Gottfried Kränzlin, the first follower of Tswett. *Chromatographia*, 39 (1994) 369-374.
- 16 Chen, S.-H.: Fundamental studies of chromatographic systems using fluorescence spectroscopy. Avail. *Univ. Microfilms Int.*, Order No. DA9406471, 1993, 285 p.; C.A., 121 (1994) 49379m.
- 17 Chuang, C.-Z., Ragan, F.A., Jr. and Prasad, C.: Use of triethylamine as an ion-pairing reagent. *J. Liq. Chromatogr.*, 17 (1994) 2383-2394.
- 18 Dolan, J.W.: Obtaining separations, Part IV: putting it all together. *LC-GC Int.*, 7, No. 10 (1994) 550-552.
- 19 Farkas, T., Chambers, J.Q. and Guiochon, G.: Column efficiency and radial homogeneity in liquid chromatography. *J. Chromatogr. A*, 679 (1994) 231-245.
- 20 Gjerde, D.T.: Preventing contamination of a chromatography column and apparatus for liquid chromatography. *PCT Int. Appl. WO 94 08,685 (Cl. B01D15/08)*, 28 Apr. 1994, US Appl. 962, 097, 16 Oct. 1992; 31 p.; C.A., 121 (1994) 112538e.
- 21 He, Y.: Magnetic resonance studies of factors controlling chromatographic retention and selectivity behavior in micellar liquid chromatography. Avail. *Univ. Microfilms Int.*, Order No. DA9321885, 1993, 135 p.; C.A., 121 (1994) 43386q.
- 22 Kaufmann, P., Kowalski, B.R. and Alander, J.: Multivariate optimization strategy for liquid chromatography. I. Targeting the search area in the multidimensional solvent space. *Chemom. Intell. Lab. Syst.*, 23 (1994) 331-339; C.A., 121 (1994) 72746n.

- 23 Park, J.H., Dallas, A.J., Chau, P. and Carr, P.W.: Limitation of the ET(30) solvent strength scale in reversed-phase liquid chromatography. *J. Chromatogr. A*, 677 (1994) 1-9.
- 24 Seaver, C. and Sadek, P.: Solvent selection, Part I. UV absorption characteristics. *LC-GC Int.*, 7, No. 11 (1994) 631-636.
- 25 Woodbury, C.P., Jr.: A stochastic model of chromatography. *J. Chromatogr. Sci.*, 32 (1994) 339-348.

See also 3, 4, 90, 188, 1039.

2b. Thermodynamics and theoretical relationships

- 26 Boehm, R.E. and Martire, D.E.: Theory of homopolymer retention in the weak adsorption limit. *J. Liq. Chromatogr.*, 17 (1994) 3145-3177.
- 27 Bowlin, D.W., Hott, C. and Davis, J.M.: Influence of integrator parameters on estimates calculated with the statistical model of overlap. *J. Chromatogr. A*, 677 (1994) 307-318.
- 28 Debets, A.J.J., von Wier, P., Hupe, K.-P., Brinkman, U.A.T. and Kok, W.T.: Theoretical models for electrodialytic sample treatment in trace analysis by liquid chromatography. *Chromatographia*, 39 (1994) 460-468.
- 29 Fornstedt, T. and Guiochon, G.: Comparison between experimental and theoretical profiles of high concentration elution bands and large system peaks in nonlinear chromatography. *Anal. Chem.*, 66 (1994) 2686-2693.
- 30 Gadom, D. and Cramer, S.M.: Salt effects in anion exchange displacement chromatography: comparison of pentosan polysulfate and dextran sulfate displacers. *Chromatographia*, 39 (1994) 409-418.
- 31 Guillaume, Y. and Guinchard, C.: A new method of studying temperature dependence and the effect of mobile phase composition on the retention mechanism in reversed phase liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2809-2820.
- 32 Havalec, P. and Sevcik, J.G.K.: Concept of additivity for a non-polar solute-solvent criterion $\log L^{16}$. Non-aromatic compounds. *J. Chromatogr. A*, 677 (1994) 319-329.
- 33 Heinisch, S., Riviere, P. and Rocca, J.L.: Computerized optimization of gradient elution conditions with ternary solvent mobile phases in RPLC. *Chromatographia*, 39 (1994) 216-223.
- 34 Kuntz, M.A., Dubin, P.L., Kaplan, J.I. and Mehta, M.S.: Evaluation of models for size exclusion chromatography of asymmetric solutes. *J. Phys. Chem.*, 98 (1994) 7063-7067; C.A., 121 (1994) 77548j.
- 35 Miyabe, K. and Suzuki, M.: Mass-transfer phenomena on the surface of adsorbents in reversed-phase chromatography. *Ind. Eng. Chem. Res.*, 33 (1994) 1792-1802; C.A., 121 (1994) 43713u.
- 36 Schnittny, J.C.: Affinity retardation chromatography: characterization of the method and its application. The description of low-affinity laminin self-interactions. *Anal. Biochem.*, 222 (1994) 140-148.
- 37 Thede, R., Haberland, D., Deng, Z. and Langer, S.H.: Second-order kinetics in the liquid chromatographic reactor. *J. Chromatogr. A*, 683 (1994) 279-291.
- 38 Torres-Lapasió, J.R., Villanueva-Camañas, R.M., Sanchis-Mallols, J.M., Medina-Hernández, M.J. and García-Alvarez-Coque, M.C.: Interpretative strategy for optimization of surfactant and alcohol concentration in micellar liquid chromatography. *J. Chromatogr. A*, 677 (1994) 239-253.

For additional information see C.A.:

121 (1994) 30449n, 103305z.

See also 21, 25, 113, 117, 127, 131, 181, 182, 1002, 1015, 1042, 1249, 1278, 1286.

2c. Relationship between structure and chromatographic behaviour

- 39 Henczi, M., Nagy, J. and Weaver, D.F.: Determination of octanol-water partition coefficients for a series of imidazolidinediones by a novel combination of micro shake-flask and HPLC techniques. *J. Liq. Chromatogr.*, 17 (1994) 2605-2613.
- 40 Itoh, H., Kinoshita, T. and Nimura, N.: (Binary-layered phase liquid chromatography: retention behavior of small molecules on diol phase). *Kuromatogurafu*, 14 (1993) 14-15; C.A., 121 (1994) 49396q.
- 41 Kim, H.S., Kim, T.K. and Lee, D.W.: Prediction of high-performance liquid chromatographic retention data of carboxamides and oxadiazoles. *J. Liq. Chromatogr.*, 17 (1994) 2615-2623.
- 42 Peng, C.T.: Retrieval of structure information from retention index. *J. Chromatogr. A*, 678 (1994) 189-200 - a review with 50 refs.
- 43 Vervoort, R.J.M., Derkens, M.W.J. and Maris, F.A.: Selection of stationary phases for the liquid chromatographic analysis of basic compounds using chemometric methods. *J. Chromatogr. A*, 678 (1994) 1-15.

See also 392, 977.

2d. Measurement of physico-chemical and related values

- 44 Crow, J.A.: Using calibration data as a diagnostic tool in gel permeation chromatography. *LC-GC*, 11 (1993) 668-671; C.A., 121 (1994) 135167x.
- 45 Giddings, J.C.: Universal calibration in size exclusion chromatography and thermal field-flow fractionation. *Anal. Chem.*, 66 (1994) 2783-2787.

For additional information see C.A.:

121 (1994) 135165v.

See also 39, 212, 282, 1013, 1019, 1027, 1032, 1038, 1040, 1247.

3. GENERAL TECHNIQUES

3a. Apparatus and accessories

- 46 Beinert, W.-D.: Function control of HPLC instruments according to quality standards. *LC-GC Int.*, 7, No. 10 (1994) 568-576.
- 47 Buttler, T., Jarskog, H., Gorton, L., Marko-Varga, G. and Ramnemark, L.: The use of microdialysis for sampling in column liquid chromatography. *Int. Lab.*, 24, No. 9 (1994) P12-P18.
- 48 Dadoo, R., Colon, L.A., Fishman, H.A., Shear, J.B. and Zare, R.N.: Sample separation method and apparatus. U.S. US 5,310,463 (Cl. 204-180.1; G01N27/26) 10 May 1994, Appl. 975,850, 13 Nov. 1992, 10 p.; C.A., 121 (1994) 49340s.

- 49 Gabeler, S.C. and Carson, W.W.: Fluid metering, mixing and composition control system. *Eur. Pat. Appl.* EP 583,003 (Cl. G01N30/34), 16 Feb. 1994, US Appl. 929,051, 13 Aug. 1992; 21 p.; *C.A.*, 121 (1994) 124265b.
- 50 Gatten, R.A., Miller, L.A., McCall, T.J., Jr. and Nau, V.J.: Method and apparatus for degassing a liquid. *U.S. US 5,290,340* (Cl. 95-46; B01D19/00), 01 Mar. 1994, US Appl. 622,999, 04 Dec. 1990; 18 p.; *C.A.*, 121 (1994) 194630r.
- 51 Harvey, M.C., Robinson, R.E., Harvey, M.C. and Stearns, S.D.: Further studies on high-speed switching of chromatographic valves. *J. Chromatogr. Sci.*, 32 (1994) 190-194.
- 52 Johnson, D.M. and Stoehnhoek, L.E.: Field portable liquid chromatographic system. *Eur. Pat. Appl.* EP 600,213 (Cl. G01N30/02), 08 Jun. 1994, US Appl. 969,324, 30 Oct. 1992; 28 p.; *C.A.*, 121 (1994) 169336s.
- 53 Meacham, R.I., Buffham, B.A., Mason, G. and Drott, D.W.: An isothermal-enclosure air-bath thermostat for experimental apparatus. *Chem. Eng. Res. Des.*, 72 (1994) 263-271; *C.A.*, 121 (1994) 38138f.
- 54 Purser, K.H.: A future AMS/chromatography instrument for biochemical and environmental measurements. *Nucl. Instrum. Methods Phys. Res., Sect. B*, 92 (1994) 201-206; *C.A.*, 121 (1994) 169113s.
- 55 Rusek, M., Cigankova, M., Krejci, M. and Kahle, V.: New μ LC/GC interface. *J. Microcolumn Sep.*, 6 (1994) 245-248; *C.A.*, 121 (1994) 169280u.

For additional information see *C.A.*:

121 (1994) 169135a.

See also 88, 105, 379, 456.

3b. Detectors and detection reagents

- 56 Balagangadharan, V.P., Kannan, K.G. and Ninan, K.N.: Online light scattering-gel permeation chromatographic analysis of propellant binders. In: Bhardwaj, I.S. (Editor), *Polym. Sci.*, 2, Allied Publ., New Delhi, 1994, pp. 725-730; *C.A.*, 121 (1994) 60753z.
- 57 Bohs, C.E., Linhares, M.C. and Kissinger, P.T.: The UniJet: a new electrochemical detector for microbore liquid chromatography. *Curr. Sep.*, 12 (1994) 181-186; *C.A.*, 121 (1994) 49167r.
- 58 Chen, L. and Krull, I.S.: Electrochemical detection as an alternative to UV in RP-HPLC peptide mapping. *Electroanalysis (N.Y.)*, 6 (1994) 1-8; *C.A.*, 121 (1994) 129121m.
- 59 Conte, E.D.: An aerosol alkali flame ionization detector for gas chromatography and high-performance liquid chromatography. *Avail. Univ. Microfilms Int.*, Order No. DA9326186, 1993, 146 p.; *C.A.*, 121 (1994) 49369h.
- 60 Gergely, A.: The use of circular dichroism as a liquid chromatographic detector. *Tech. Instrum. Anal. Chem.*, 14 (1994) 279-292; *C.A.*, 121 (1994) 147993b - a review with 30 refs.
- 61 Isildak, I. and Covington, A.K.: Ion-selective electrode potentiometric detection in ion chromatography. *Electroanalysis (N.Y.)*, 5 (1993) 815-824; *C.A.*, 121 (1994) 72581e.
- 62 Josefson, M., Lick, S., Larsson, S. and Takenbergs-Hjelte, L.: Single sample linearity test for wavelength scanning detectors in liquid chromatography. *Chemom. Intell. Lab. Syst.*, 23 (1994) 87-95; *C.A.*, 121 (1994) 72572c.

- 63 Kohn, A.: The application of peak purity analysis in liquid chromatography and capillary electrophoresis. *LC-GC Int.*, 7, No. 11 (1994) 652-660.
- 64 Maystre, F., Bruno, A.E., Kühner, C. and Widmer, H.M.: Enhanced polarimetric detection in HPLC using a refractive index equalizer. *Anal. Chem.*, 66 (1994) 2882-2887.
- 65 Ohkura, Y., Kai, M. and Nohta, H.: Fluorogenic reactions for biomedical chromatography. *J. Chromatogr. B*, 659 (1994) 85-107 - a review with 183 refs.
- 66 Plante, L.D., Romano, P.M. and Fernandez, E.J.: Viscous fingering in chromatography visualized via magnetic resonance imaging. *Chem. Eng. Sci.*, 49 (1994) 2229-2241; *C.A.*, 121 (1994) 129159e.
- 67 Qi, X.S.: Metallophthalocyanine electrodes: chromatographic detection and electrosynthesis. *Avail. Univ. Microfilms Int.*, Order No. DA9332940, 1993, 166 p.; *C.A.*, 121 (1994) 49372d.
- 68 Roberts, R.E. and Johnson, D.C.: Fast-pulsed electrochemical detection at noble metal electrodes: the frequency-dependent response at gold electrodes for chromatographically separated carbohydrates. *Electroanalysis (N.Y.)*, 6 (1994) 269-273; *C.A.*, 121 (1994) 124353d.
- 69 Roepke, W.: (Application of the light scattering detector in HPLC). *LaborPraxis*, 18 (1994) 57-59; *C.A.*, 121 (1994) 194574a.
- 70 Ryerson, T.B., Dunham, A.J., Barkley, R.M. and Sievers, R.E.: Sulfur-selective detector for liquid chromatography based on sulfur monoxide-ozone chemiluminescence. *Anal. Chem.*, 66 (1994) 2841-2851.
- 71 Sanchis Mallols, J.M., Villanueva Camanas, R.M. and Ramis-Ramos, G.: Concentration gradient perturbations in micellar liquid chromatography with thermal lens spectrophotometric detection. *Anal. Lett.*, 27 (1994) 2011-2026.
- 72 Stevenson, S. and Dorn, H.C.: ^{13}C Dynamic nuclear polarization: a detector for continuous-flow, on-line chromatography. *Anal. Chem.*, 66 (1994) 2993-2999.
- 73 Tabei, H., Takahashi, M., Hoshino, S., Niwa, O. and Horiuchi, T.: Subfemtomole detection of catecholamine with interdigitated array carbon microelectrodes in HPLC. *Anal. Chem.*, 66 (1994) 3500-3502.
- 74 Tran, C.D., Grishko, V.I. and Huang, G.: Chiral detection in high-performance liquid chromatography by vibrational circular dichroism. *Anal. Chem.*, 66 (1994) 2630-2635.
- 75 Wu, J., Zhang, Z. and Lu, J.: (New development in liquid chromatography-chemiluminescence detection). *Fenxi Huaxue*, 22 (1994) 396-405; *C.A.*, 121 (1994) 169265t - a review with 168 refs.

See also 131, 137, 187, 208, 228, 244, 271, 338, 348, 357, 379, 426, 432, 444, 478, 489, 557, 687, 881, 929, 981, 1028, 1032, 1051, 1202, 1277, 1290.

3c. Sorbents and columns, packing procedures

- 76 Antonucci, V.L.: Studies of the solvation of polystyrene by binary solvents for liquid chromatography. *Avail. Univ. Microfilms Int.*, Order No. DA9404265, 1993, 276 p.; *C.A.*, 121 (1994) 49364c.
- 77 Belroni, A., Cappiello, A., Famiglini, G. and Palma, P.: Generation of split-flow micro-gradients for capillary HPLC. *Chromatographia*, 39 (1994) 279-284.

- 78 Brown, V.A., Barrett, D.A., Shaw, P.N., Davies, M.C., Ritchie, H.J., Ross, P., Paul, A.J. and Watts, J.F.: Characterization of a range of alkyl-bonded silica HPLC stationary phases: XPS and ToF-SIMS studies. *Surf. Interface Anal.*, 21 (1994) 263-273; C.A., 121 (1994) 194579f.
- 79 Buszewski, B., Kasturi, P., Gilpin, R.K., Gandoda, M.E. and Jaroniec, M.: Chromatographic and related studies of alkylamide phases. *Chromatographia*, 39 (1994) 155-161.
- 80 Ciolino, L.A. and Dorsey, J.G.: Phosphorimetry and its potential for the study of surface heterogeneity of chromatographic silica-based stationary phases. *J. Chromatogr. A*, 678 (1994) 201-212.
- 81 Falkenhagen, J. and Dietrich, P.G.: New aspects concerning the stability of silica-based HPLC separation phases. *Int. Lab.*, 24, No. 10 (1994) P11-P16.
- 82 Francotte, E., Grolimund, K. and Juvancz, Z.: Benzoylcellulose derivatives as chiral stationary phases for open tubular column chromatography. *Chirality*, 5 (1993) 232-237; C.A., 121 (1994) 72734g.
- 83 Gross-Bley, M., Boemer, B., Grosser, R., Lange, W., Hoever, F.P. and Artl, D.: Preparation of optically active amino acid sulphoxide and sulphone monomers and their polymers for chromatographic separation of racemates. *Eur. Pat. Appl. EP 576,949* (Cl. C07C31/50), 05 Jan. 1994, DE Appl. 4,221,711, 02 Jul. 1992, 35 p.; C.A., 121 (1994) 109849b.
- 84 Inoue, S. and Ohtaki, N.: Metaphosphates as packing materials for biochromatography. *J. Chromatogr. A*, 679 (1994) 247-253.
- 85 Jinno, K. and Nakamura, H.: Retention characteristics of fluorinated bonded silica phase in reversed-phase liquid chromatography. *Chromatographia*, 39 (1994) 285-293.
- 86 Joseph, T., Pearson, A.J., Adam, R.C. and Swift, O.A.: Chromatography column with constant pressure differential and flow velocity. U.S. US 5,324,426 (Cl. 210-198.2; B01D15/08), 28 Jun. 1994, Appl. 855,095, 20 Mar. 1992; 12 p.; C.A., 121 (1994) 112136x.
- 87 Jungbauer, A. and Lettner, H.P.: Chemical disinfection of chromatographic resins. Part 1: Preliminary studies and microbial kinetics. *BioPharm (Eugene)*, 7 (1994) 46-56; C.A., 121 (1994) 141635q.
- 88 King, B.W., Westlake, J.P., Myers, P., Zimina, T. and Smith, R.M.: An investigation of the instrumental and packing parameters affecting the routine use and application of microbore and capillary HPLC columns. *LC-GC Int.*, 7, No. 12 (1994) 702-709.
- 89 Kirkland, J.J.: Trends in HPLC column design for improved method development. *Int. Lab.*, 24, No. 9 (1994) P4-P11.
- 90 Labine, B.K., Cooper, W.T., III, He, Y., Hendayana, S., Han, J.H. and Tetreault, J.: Solid-state ¹³C NMR studies of ionic surfactants adsorbed on C-18 and C-8 silicas: implications for micellar liquid chromatography. *J. Colloid Interface Sci.*, 165 (1994) 497-504; C.A., 121 (1994) 66545e.
- 91 Lameloise, M.-L. and Viard, V.: Choice of a tracer for external porosity measurement in ion-exchange resin beds. *J. Chromatogr. A*, 679 (1994) 255-259.
- 92 Lavine, B.K., Hendayana, S. and Tetreault, J.: Selectivity in micellar reversed-phase liquid chromatography: C-18 and C-8 alkyl bonded phases. *Anal. Chem.*, 66 (1994) 3458-3465.
- 93 Li, X. and Liu, G.: (Porous zirconia and its application in chromatography as stationary phase). *Huaxue Tongbao*, (1994) 17-21; C.A., 1121 (1994) 124060f - a review with 29 refs.
- 94 Lin, S.: Studies of the surface composition of reversed-phase liquid chromatographic packings. Avail. *Univ. Microfilms Int.*, Order NO. DA9317549, 1992, 186 p.; C.A., 121 (1994) 49390h.
- 95 Majors, R.E.: Keeping HPLC column operating costs under control. *LC-GC Int.*, 7, No. 12 (1994) 686-690.
- 96 Murakami, R., Hachisaka, H., Yamada, K. and Motozato, Y.: Gel permeation chromatographic properties of poly(vinyl alcohol) gel particles prepared by freezing and thawing. *J. Chromatogr. A*, 678 (1994) 180-182.
- 97 Pilette, J.F.: (MCLC: Membrane convective liquid chromatography). *Spectra Anal.*, 23 (1994) 43-46; C.A., 121 (1994) 199821p - a review with 4 refs.
- 98 Pirkle, W.H. and Bowen, W.E.: Chiral stationary phase design: a study in optimization. *J. High Resolut. Chromatogr.*, 17 (1994) 629-633.
- 99 Riering, H. and Sieber, M.: Cyclodextrin chromatography medium for pharmacologically active substances. *Eur. Pat. Appl. EP 608,703* (Cl. B01J20/32), 03 Aug. 1994, DE Appl. 9,300,912, 23 Jan. 1993; 9 p.; C.A., 121 (1994) 160178j.
- 100 Sajc, L.M., Jovanovic, Z.R., Jovanovic, G.N., Vunjak-Novakovic, G., Pesic, R.D. and Vukovic, D.V.: (Fluid dynamics of a magnetically stabilized fluidized bed chromatography column). *Hem. Ind.*, 47 (1993) 62-68; C.A., 121 (1994) 199947j.
- 101 Schmidt, L.W.: Chemically modified polymeric resins for solid-phase extraction and group separation prior to analysis by liquid or gas chromatography. Avail. *Univ. Microfilms Int.*, Order No. DA9335017, 1993, 123 p.; C.A., 121 (1994) 49395p.
- 102 Shih, J.S.: Applications of macrocyclic polyethers in analytical sensors and ion separation. *J. Chin. Chem. Soc. (Taipei)*, 41 (1994) 309-314; C.A., 121 (1994) 124052e - a review with 33 refs.
- 103 Stalling, D.L., Guo, C., Kuo, K.C. and Saim, S.: Fullerene-linked particles as LC chromatographic media and modification of their electron donor/acceptor properties by secondary chemical reactions. *J. Microcolumn Sep.*, 5 (1993) 223-235; C.A., 121 (1994) 72736j.
- 104 Steenackers, D. and Sandra, P.: On the analysis of polar solutes on 50 µm i.d. open tubular LC columns. *J. High Resolut. Chromatogr.*, 17 (1994) 557-559.
- 105 Vozka, S., Brezina, M., Moravec, V., Kriz, J. and Vodicka, L.: Column for preparative liquid chromatography. *Czech Rep. CZ 277,859* (Cl. G01N30/60), 16 Jun. 1993, Appl. 3,722, 21 Jun. 1989; 5 p.; C.A., 121 (1994) 194629x.
- 106 Wirth, M.J.: Spectroscopic probing of reversed-phase chromatographic retention. *LC-GC Int.*, 7, No. 11 (1994) 626-630.
- 107 Yamagishi, A., Tanaka, I., Taniguchi, M. and Takahashi, M.: Poly(isocyanide) as a chiral adsorbent in liquid column chromatography. *J. Chem. Soc., Chem. Commun.*, (1994) 113-114; C.A., 121 (1994) 169298f.

For additional information see C.A.:

- 121 (1994) 49384j, 49398s, 49452e, 49453f, 72790x, 92756u, 103596v, 103597w, 136451x, 158382c, 158789r, 159875c, 159895j.

- See also 113, 115, 143, 145, 158, 167, 168, 170, 172, 174, 197, 268, 328, 542, 847, 854, 913, 924, 1003, 1016, 1026, 1028, 1044, 1102, 1247, 1276.

3d. Quantitative analysis

- 108 Jones, T.L., Betowski, L.D. and Lopez-Avila, V.: Validation of liquid chromatography-mass spectrometry methods: interlaboratory studies. *TrAC*, 13 (1994) 333-338.

See also 119, 476, 595, 1165.

3e. Preparative scale chromatography

- 109 Chizhkov, V.P. and Varivonchik, N.E.: (High-efficiency preparative liquid low-pressure chromatography). *Zh. Fiz. Khim.*, 68 (1994) 705-708; *C.A.*, 121 (1994) 38229m.
- 110 Gerstner, J.A.: Novel preparative chromatographic techniques: displacement and membrane systems. *Avail. Univ. Microfilms Int.*, Order No. DA9405672, 1993, 116 pp.; *C.A.*, 121 (1994) 30450f.
- 111 Hu, S. and Do, D.D.: Effect of feed concentration on the preparative separation of systems having reversed selectivity. *J. Chromatogr. A*, 683 (1994) 311-320.
- 112 Newburger, J., DeLange, B. and Guiochon, G.: New hybrid displacement technique for preparative liquid chromatography. *J. Chromatogr. A*, 684 (1994) 1-11.
- 113 Sarker, M. and Guiochon, G.: Study of the packing behavior of radial compression columns for preparative chromatography. *J. Chromatogr. A*, 683 (1994) 293-309.

See also 105, 374, 463, 561, 587, 610, 611, 871, 914, 1158.

3f. Programmed temperature, pressure, vapors, gradients

See 183.

4. SPECIAL TECHNIQUES

4a. Automation

- 114 Buhlmann, R., Carmona, J., Donzel, A., Donzel, N. and Gil, J.: An open software environment to optimize the productivity of robotized laboratories. *J. Chromatogr. Sci.*, 32 (1994) 243-248.

See also 129, 199, 1049, 1066, 1074, 1083, 1114.

4b. Computerization and modelling

- 115 Cserhati, T.: Use of principal component and cluster analysis for the comparison of reversed-phase HPLC-columns. *Anal. Lett.*, 27 (1994) 2615-2637.
- 116 Dessy, R.E.: Chromatography and computers: a decade of direction and discontent. *J. Chromatogr. Sci.*, 32 (1994) 209-212.
- 117 Felinger, A.: Deconvolution of overlapping skewed peaks. *Anal. Chem.*, 66 (1994) 3066-3072.
- 118 Gonzalez, C.: Computer systems validation: a practical approach to an effective investment. *LC-GC Int.*, 7, No. 10 (1994) 564-566.

- 119 Hayashi, Y. and Matsuda, R.: Deductive prediction of measurement precision from signal and noise in liquid chromatography. *Anal. Chem.*, 66 (1994) 2874-2881.
- 120 Jochum, P.: (New opportunities for reports in modern chromatography). *LaborPraxis*, 18 (1994) 62-67; *C.A.*, 121 (1994) 49361z.
- 121 Lameloise, M.L. and Viard, V.: Modelling and simulation of a glucose-fructose simulated moving-bed adsorber. *Food Bioprod. Process.*, 71 (1993) 27-32; *C.A.*, 121 (1994) 86138c.
- 122 Lysakowski, R.: Standards for chromatographic data communications, storage, and archiving. *J. Chromatogr. Sci.*, 32 (1994) 236-242.
- 123 McCoy, B.J. and Goto, M.: Continuous-mixture model of chromatographic separations. *Chem. Eng. Sci.*, 49 (1994) 2351-2357; *C.A.*, 121 (1994) 112257n.
- 124 Meyer, V.R.: Generation and investigation of chromatographic peaks using a spreadsheet program. *LC-GC Int.*, 7, No. 10 (1994) 590-596.
- 125 Penn, S.G., Liu, G., Bergström, E.T., Goodall, D.M. and Loran, J.S.: Systematic approach to treatment of enantiomeric separations in capillary electrophoresis and liquid chromatography. I. Initial evaluation using propranolol and dansylated amino acids. *J. Chromatogr. A*, 680 (1994) 147-155.
- 126 Podgórny, A. and Kowalska, T.: Physico-chemical modeling of solute retention in reversed phase liquid chromatography with acetonitrile - phosphate buffer eluents. *J. Planar Chromatogr.*, 7 (1994) 291-293.
- 127 Podgórny, A. and Kowalska, T.: Physico-chemical modeling of solute retention in reversed phase liquid chromatography with tetrahydrofuran-phosphate buffer and acetone-phosphate buffer eluents. *J. Planar Chromatogr.*, 7 (1994) 217-220.
- 128 Stauffer, S.T. and Dessy, R.E.: CHIRULE: a chiral chromatographic column selection system utilizing similarity searching. *J. Chromatogr. Sci.*, 32 (1994) 228-235.
- 129 Webster, G. and Knauer, W.: Optimized on-line solvent recycling in HPLC using an intelligent chromatography data system. *LC-GC Int.*, 7, No. 10 (1994) 577-588.

For additional information see *C.A.*:
121 (1994) 49408v, 148050d.

See also 28, 46, 161, 188, 342, 474, 600, 857, 928.

4c. Combination with other physico-chemical techniques (MS, IR etc.)

- 130 Allen, D.W., Clench, M.R., Crowson, A., Leathard, D.A. and Sakalatalva, R.: Characterisation of electron beam generated transformation products of Irganox 1010 by particle beam liquid chromatography-mass spectrometry with on-line diode array detection. *J. Chromatogr. A*, 679 (1994) 285-297.
- 131 Andrews, R.W. and Richardson, H.: Effect of spectral resolution, detector linearity and chromatographic resolution on peak purity calculations. *J. Chromatogr. A*, 683 (1994) 3-8.
- 132 Blomberg, J., Schoenmakers, P.J. and van den Hoed, N.: Automated sample cleanup using on-line coupling of size exclusion chromatography to high resolution gas chromatography. *J. High Resolut. Chromatogr.*, 17 (1994) 411-414.

- 133 Ferguson, G.K.: Investigation of pharmaceutical analyses with monodisperse aerosol generator interface combining liquid chromatography with Fourier transform infrared (MAGIC-LC/FT-IR) spectrometry. Avail. *Univ. Microfilms Int.*, Order No. DA9404649, 1993, 234 p.; C.A., 121 (1994) 117843k.
- 134 Mank, A., Gooijer, C., Lingeman, H., Velthorst, N. and Brinkman, U.: Liquid chromatography combined with visible diode-laser induced fluorescence detection for photosensitizers. *Proc. SPIE-Int. Soc. Opt. Eng.*, 2084(Biomedical Optoelectronic Devices and Systems) (1994) 255-266; C.A., 121 (1994) 173964n.
- 135 Martin, M.: (What performance is expected from coupling in chromatography?) *Spectra 2000*, 169 (1992) 5-9; C.A., 121 (1994) 148001p - a review with 8 refs.
- 136 Roberts, J.K. and Smith, R.J.: Use of liquid chromatography-nuclear magnetic resonance spectroscopy for the identification of impurities in drug substances. *J. Chromatogr. A*, 677 (1994) 385-389.
- 137 Sheppard, B.S. and Caruso, J.A.: Plasma mass spectrometry: consider the source. Invited lecture. *J. Anal. At. Spectrom.*, 9 (1994) 145-149; C.A., 121 (1994) 72476z - a review with 64 refs.
- 138 Tinke, A.P., Niessen, W.M.A., Thaden, U.R. and van der Greef, J.: Hyperthermal surface ionization as a new interfacing approach in liquid chromatography/mass spectrometry. *Anal. Chem.*, 66 (1994) 3005-3012.
- 139 Wolfender, J.-L., Maillard, M. and Hostettmann, K.: Thermospray liquid chromatography-mass spectrometry in phytochemical analysis. *Phytochem. Anal.*, 5 (1994) 153-182; C.A., 121 (1994) 199813n.
- 140 Yamamoto, H., Ichimura, K., Nakamura, K., Maeda, T., Tajima, T. and Wada, K.: Concentration and transfer methods for a thin-layer chromatography plate, and a liquid-chromatography/IR measuring method. U.S. US 5,306,645 (Cl. 436-162; G01N30/94), 26 Apr. 1994, JP Appl. 90/23,409, 31 Jan. 1990, 10 p.; C.A., 121 (1994) 49339y.
- For additional information see C.A.:
121 (1994) 98629b.
- See also 54, 55, 72, 77, 108, 186, 196, 198, 200, 203, 204, 244, 265, 330, 357, 380, 398, 399, 405, 424, 460, 508, 523, 532, 536, 550, 684, 820, 834, 838, 839, 855, 863, 873, 927, 942, 945, 962, 967, 974, 982, 990, 1014, 1038, 1048, 1050, 1100, 1130, 1142, 1180, 1183, 1237, 1239, 1243, 1272, 1280, 1281, 1282, 1283.
- 4d. Affinity chromatography (advances)*
- 141 Cummings, R.D.: Use of lectins in analysis of glycoconjugates. *Methods Enzymol.*, 230(Guide to Techniques in Glycobiology) (1994) 66-86; C.A., 121 (1994) 77545f.
- 142 Di Russo, C., Rogers, R.P. and Jarrett, H.W.: Novel DNA-Sepharose purification of the FadR transcription factor. *J. Chromatogr. A*, 677 (1994) 45-52.
- 143 Glavanovich, M.H. and Carr, P.W.: Easily regenerable affinity chromatographic zirconia-based support with concanavalin A as model ligand. *Anal. Chem.*, 66 (1994) 2584-2589.
- 144 Harakas, N.K.: Biospecific affinity chromatography. *Bioprocess Technol.*, 18(Protein Purification Process Engineering) (1994) 259-316; C.A., 121 (1994) 77504s - a review with 472 refs.
- 145 Hirayama, T.: (Affinity chromatography carrier). *Kobunshi Kako*, 43 (1994) 60-66; C.A., 121 (1994) 194555v - a review with 33 refs.
- 146 Jack, G.W.: Immunoaffinity chromatography. *Mol. Biotechnol.*, 1 (1994) 59-86; C.A., 121 (1994) 30090p - a review with 100 refs.
- 147 Kobata, A.: Affinity chromatography with use of immobilized lectin columns. *Biochem. Soc. Trans.*, 22 (1994) 360-364; C.A., 121 (1994) 30163q.
- 148 Liu, H.C.: Membrane-based affinity chromatography: modeling and experiments of lysozyme onto Cibacron blue ligand immobilized on microporous cellulose membranes. Avail. *Univ. Microfilms Int.*, Order No. DA9407814, 1993, 200 pp.; C.A., 121 (1994) 103059x.
- 149 Nokihara, K. and Ando, E.: Rapid and efficient preparation of affinity columns, in which peptide as ligands are bound to the solid-phase support. *Pept. Chem.*, 31st (1993) 25-28; C.A., 121 (1994) 57970n.
- 150 Ono, S., Miura, T., Sakai, Y., Yoshimura, T., Shimasaki, C. and Tsukurimichi, E.: Property of chromatography gel on which an amphipathic β -structural peptide is immobilized. *Pept. Chem.*, 31st (1993) 125-128; C.A., 121 (1994) 83968n.
- 151 Santambien, P., Sdioui, N., Hebert, E., Girot, P., Hulak, I., Roche, A.C., Monsigny, M. and Boschetti, E.: (*In vitro* and *in vivo* toxicity studies on dye ligands used in affinity chromatography). *Ann. Pharm. Fr.*, 52 (1994) 137-152; C.A., 121 (1994) 101324f.
- 152 Yip, T.T. and Hutchens, T.W.: Immobilized metal ion affinity chromatography. *Mol. Biotechnol.*, 1 (1994) 151-164; C.A., 121 (1994) 152361y.

For additional information see C.A.:

121 (1994) 7770a, 30507e, 30520d, 50231p, 77786k, 173627e, 304007x.

See also 305, 546, 547, 565, 581, 597, 622, 670, 705, 727, 785, 806, 1214.

4f. Trace analysis and preseparation techniques

- 153 McDowall, R.D.: The universal SPE method. *LC-GC Int.*, 7, No. 11 (1994) 638-642.
- 154 Parks, O.W. and Maxwell, R.J.: Isolation of sulfonamides from fortified chicken tissues with supercritical CO₂ and in-line adsorption. *J. Chromatogr. Sci.*, 32 (1994) 290-293.
- 155 Wan, H.B., Lan, W.G., Wong, M.K., Mok, C.Y. and Poh, Y.H.: Orthogonal array designs for the optimization of solid-phase extraction. *J. Chromatogr. A*, 677 (1994) 255-263.

See also 101, 132, 192, 956, 975, 1036, 1238, 1269, 1285.

4g. Enantiomers, separation

- 156 Bradshaw, J.S., Huszthy, P., Wang, T., Zhu, C., Nazarenko, A.Y. and Izatt, R.M.: Enantiomeric recognition and separation of chiral organic ammonium salts by chiral pyridino-18-crown-6 ligands. *Supramol. Chem.*, 1 (1993) 267-275; *C.A.*, 121 (1994) 82406r.
- 157 Gorog, S. and Gazdag, M.: Enantiomeric derivatization for biomedical chromatography. *J. Chromatogr. B*, 659 (1994) 51-84 - a review with 218 refs.
- 158 Hyun, M.H., Jin, J.S., Ryoo, J.J. and Jyung, K.K.: Preparation of a new chiral stationary phase bearing both α -acidic and β -basic sites from (S)-naproxen for the liquid chromatographic resolution of enantiomers. *Bull. Korean Chem. Soc.*, 15 (1994) 497-502; *C.A.*, 121 (1994) 204921c.
- 159 Isaksson, R., Pettersson, C., Pettersson, G., Jönsson, S., Stålberg, J., Hermansson, J. and Marle, I.: Cellulases as chiral selectors. *TrAC*, 13 (1994) 431-439 - a review with 41 refs.
- 160 Khan, A.Z.-Q. and Sandstroem, J.: Enantiomer and diastereoisomer resolution, rotational barriers, and CD and UV spectra of some twisted push-pull ethylenes. *J. Chem. Soc., Perkin Trans. 2*, (1994) 1575-1579; *C.A.*, 121 (1994) 156821w.
- 161 Koppenhoefer, B., Behnisch, R., Nothdurft, A., Trettin, U., Pierrot-Sanders, J., Piras, P., Popescu, C. and Roussel, C.: (CHIR-BASE. A factual database for the chromatographic resolution of enantiomers). *Mitteilungsbl.-Ges. Dtsch. Chem. Fachgruppe Chem.-Inf.-Comput.*, 26 (1993) 19-20; *C.A.*, 121 (1994) 133193d.
- 162 Kumar, N., Windisch, V., Trivedi, P. and Golebiowski, C.: Separation of 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitor drug substance diastereomers, and their analogues on β -cyclodextrin stationary phase. *J. Chromatogr. A*, 678 (1994) 259-263.
- 163 Kunath, A., Theil, F. and Wagner, J.: Diastereomeric and enantiomeric separation of monoesters prepared from meso-cyclopentanediols and racemic carboxylic acids on a silica phase and on amylose and cellulose chiral stationary phases. *J. Chromatogr. A*, 684 (1994) 162-167.
- 164 Laemmerhofer, M. and Lindner, W.: Assignment of absolute configuration and optical purity determination of (R)- and (S)- econazole nitrate by enantioselective HPLC: method development and application. *Chirality*, 6 (1994) 251-260; *C.A.*, 121 (1994) 157569g.
- 165 Lee, C.S. and Chen, H.H.: Determination of enantiomeric purity and absolute configuration of β -lactams by high-performance liquid chromatography on chiral columns. *J. Chin. Chem. Soc. (Taipei)*, 41 (1994) 187-190; *C.A.*, 121 (1994) 91971y.
- 166 Leiminer, A., Stephan, B. and Mannschreck, A.: Chiral 2H-pyrans. Part 4. The enantiomers of indolino spiro compounds. Barriers to thermal cleavage of their C(sp³)-O bond. *Cryst. Liq. Cryst. Sci. Technol. Sect. A*, 246 (1994) 215-221; *C.A.*, 121 (1994) 156903z.
- 167 Lin, J.-Y. and Yang, M.-H.: N-Alkylcarbamoyl derivatives of amino acids as chiral stationary phases for high-performance liquid chromatography. I. An example of enhancing enantioselectivity by deleting the non-enantioselective π - π interaction site on the chiral stationary phase. *J. Chromatogr. A*, 684 (1994) 13-21.
- 168 Oi, S., Ono, H., Tanaka, H., Shijo, M. and Miyano, S.: Axially dissymmetric bianthracene-based chiral stationary phase for the high-performance liquid chromatographic separation of enantiomers. *J. Chromatogr. A*, 679 (1994) 35-46.
- 169 Oliveros, L., Puertolas, P.F., Mingüillon, C., Camacho-Frias, E., Foucault, A. and le Goffic, F.: Donor-acceptor chiral centrifugal partition chromatography: complete resolution of two pairs of amino-acid derivatives with a chiral II donor selector. *J. Liq. Chromatogr.*, 17 (1994) 2301-2318.
- 170 Pirkle, W.H. and Welch, C.J.: Chromatographic and ¹H NMR support for a proposed chiral recognition model. *J. Chromatogr. A*, 683 (1994) 347-353.
- 171 Rustum, A.M.: Separation of the R(-) and S(+) enantiomers of the ethyl ester of tiagabine • HCl using a Chiralcel-OG column. *J. Chromatogr. A*, 684 (1994) 29-36.
- 172 Schleimer, M., Pirkle, W.H. and Schurig, V.: Enantiomer separation by high-performance liquid chromatography on polysiloxane-based chiral stationary phases. *J. Chromatogr. A*, 679 (1994) 23-34.
- 173 Staahlberg, J., Joensson, S. and Pettersson, G.: Chiral recognition by cellobiohydrolase I. *Found. Biotech. Ind. Ferment. Res. [Publ.]*, 8(*Trichoderma Reesei* Cellulases and Other Hydrolases) (1993) 273-280; *C.A.*, 121 (1994) 77544e.
- 174 Yashima, E., Fukaya, H. and Okamoto, Y.: 3,5-Dimethylphenyl-carbamates of cellulose and amylose regioselectively bonded to silica gel as chiral stationary phases for high-performance liquid chromatography. *J. Chromatogr. A*, 677 (1994) 11-19.
- For additional information see *C.A.*:
121 (1994) 142531q.
- See also 60, 74, 82, 83, 98, 107, 128, 205, 328, 426, 429, 434, 436, 437, 444, 458, 459, 461, 465, 471, 509, 515, 870, 880, 917, 940, 978, 1051, 1052, 1058, 1062, 1064, 1068, 1069, 1075, 1078, 1084, 1088, 1090, 1099, 1102, 1106, 1117, 1126, 1154, 1171, 1185.
- 4h. Other special techniques
- 175 Abelev, G.I., Karamova, E.R., Lazarevich, N.L., Kiseleva, V.I. and Poverenny, A.M.: Electrochromatography: a method for automatic immunoaffinity chromatography on porous membranes. *Immunol. Lett.*, 40 (1994) 133-138; *C.A.*, 121 (1994) 129207u.
- 176 Behnke, B. and Bayer, E.: Pressurized gradient electro-high-performance liquid chromatography. *J. Chromatogr. A*, 680 (1994) 93-98.
- 177 Belgued, J.E., Hoyos, M. and Martin, M.: Velocity profiles in thermal field-flow fractionation. *J. Chromatogr. A*, 678 (1994) 85-96.
- 178 Dolan, J.W.: Questions about ion pairing. *LC-GC Int.*, 7, No. 12 (1994) 691-692.
- 179 Hu, W., Tao, H. and Haraguchi, H.: Electrostatic ion chromatography. 2. Partitioning behavior of analyte cations and anions. *Anal. Chem.*, 66 (1994) 2514-2520.
- 180 Ito, Y. and Weisz, A.: pH-Zone-refining countercurrent chromatography. *U.S. US 5,332,504 (Cl. 210-635; B01D15/08)*, 26 Jul. 1994, Appl. 26,939, 05 Mar. 1993; 23 p.; *C.A.*, 121 (1994) 160184h.

- 181 Madamba-Tan, L.S., Strasters, J.K. and Khaledi, M.G.: Gradient elution in micellar liquid chromatography. I. Micelle concentration gradient. *J. Chromatogr. A.*, 683 (1994) 321-334.
- 182 Madamba-Tan, L.S., Strasters, J.K. and Khaledi, M.G.: Gradient elution in micellar liquid chromatography. II. Organic modifier gradients. *J. Chromatogr. A.*, 683 (1994) 335-345.
- 183 Moore, L.K.: High-temperature gradient techniques for microbore liquid chromatography. Avail. *Univ. Microfilms Int.*, Order No. DA9409347, 1993, 142 p.; C.A., 121 (1994) 49405s.
- 184 Nagaoka, T., Kakuno, K., Fujimoto, M., Nakao, H., Yano, J. and Ogura, K.: Electrochemical chromatography using a polyaniline stationary phase. II. Effect of pH of the mobile phase and column length. *J. Electroanal. Chem.*, 368 (1994) 315-317; C.A., 121 (1994) 72563a.

For additional information see C.A.:

121 (1994) 173920v, 182561f.

See also 66, 77, 87, 88, 97, 169, 282, 1023, 1033, 1040, 1234, 1261, 1263.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

5b. Cyclic hydrocarbons, fullerenes

- 185 Ellis, L., Alexander, R. and Kagi, R.I.: Separation of petroleum hydrocarbons using dealuminated mordenite molecular sieve. II. Alkynaphthalenes and alkylphenanthrenes. *Org. Geochem.*, 21 (1994) 849-855; C.A., 121 (1994) 160437t.
- 186 Galceran, M.T. and Moyano, E.: High-performance liquid chromatography-mass spectrometry (pneumatically assisted electrospray) of hydroxy polycyclic aromatic hydrocarbons. *J. Chromatogr. A.*, 683 (1994) 9-19.
- 187 Hatrik, S. and Lehotay, J.: Optimization of the detection wavelength applied to the HPLC analysis of polycyclic aromatic hydrocarbons. *J. Liq. Chromatogr.*, 17 (1994) 2833-2844.
- 188 Hellal, F., Phan-tan-luu, R. and Siouffi, A.M.: Application of solvatochromic parameters to selectivity tuning in chromatography for aromatic solutes. *J. Liq. Chromatogr.*, 17 (1994) 2845-2869.
- 189 Kister, J. and Siouffi, A.M.: Separation by HPLC of functionalized complex polyaromatics present in fossil materials. *Polycyclic Aromat. Compd.*, 3(SUPPL) (1993) 435-442; C.A., 121 (1994) 113018x.
- 190 Kurganova, A., Unger, K.K. and Eisenbeiss, F.: Separation of cyclic aromatic hydrocarbons under isocratic conditions by a column switching technique. *Chromatographia*, 39 (1994) 175-179.
- 191 Lintelmann, J., Hellermann, C. and Kettrup, A.: Coupled-column high-performance liquid chromatographic method for the determination of four metabolites of polycyclic aromatic hydrocarbons, 1-, 4- and 9-hydroxyphenanthrene and 1-hydroxypyrene, in urine. *J. Chromatogr. B.*, 660 (1994) 67-73.
- 192 Mellor, F., Just, U. and Strumpf, T.: Supercritical fluid extraction using a new restrictor design. *J. Chromatogr. A.*, 679 (1994) 147-152.

- 193 Ohta, H., Saito, Y., Jinno, K., Nagashima, H. and Itoh, K.: Temperature effects in separation of fullerene by high-performance liquid chromatography. *Chromatographia*, 39 (1994) 453-459.
- 194 Ong, C.-N. and Lee, B.-L.: Determination of benzene and its metabolites: application in biological monitoring of environmental and occupational exposure to benzene. *J. Chromatogr. B.*, 660 (1994) 1-22.
- 195 Quilliam, M.A., Hardstaff, W.R., Anacleto, J.F., LeBlanc, M.D., Stergiopoulos, V., Dick, K.L. and Bowser, M.T.: Preparation and certification of solution of perdeuterated polycyclic aromatic compounds intended for use as surrogate internal standards. *Fresenius J. Anal. Chem.*, 350 (1994) 109-118.
- 196 Robert, E., Beboulene, J.-J., Codet, G. and Enache, D.: High-performance liquid chromatography coupled off-line with capillary gas chromatography. Application to the determination of the aromatics content in middle distillates. *J. Chromatogr. A.*, 683 (1994) 215-222.
- 197 Saito, Y., Ohta, H., Nagashima, H., Itoh, K., Jinno, K., Okamoto, M., Chen, Y.-L., Luehr, G. and Archer, J.: Separation of C_{60} and C_{70} fullerenes with a triphenyl bonded silica phase in microcolumn liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2359-2372.
- 198 Sim, P.G., Quilliam, M.A., Pleasance, S., Anacleto, J., Perneau, H., Ramaley, L. and Benoit, F.M.: Application of multidimensional chromatographic/mass spectrometric techniques to the analysis of complex mixtures of polycyclic aromatic compounds (PAC). *Polycyclic Aromat. Compd.*, 3(SUPPL) (1993) 321-328; C.A., 121 (1994) 182985x.
- 199 Stevenson, S., Dorn, H.C., Burbank, P., Harich, K., Haynes, J., Jr., Klang, C.H., Salem, J.R., de Vries, M.S., van Loosdrecht, P.H.M., Johnson, R.D. et al.: Automated HPLC separation of endohedral metallofullerene $Sc@C_{2n}$ and $Y@C_{2n}$ fractions. *Anal. Chem.*, 66 (1994) 2675-2679.
- 200 Stevenson, S., Dorn, H.C., Burbank, P., Harich, K., Sun, Z., Klang, C.H., Salem, J.R., de Vries, M.S., van Loosdrecht, P.H.M., Johnson, R.D. et al.: Isolation and monitoring of the endohedral metallofullerenes $Y@C_{62}$ and $Sc_3@C_{62}$: on-line chromatographic separation with EPR detection. *Anal. Chem.*, 66 (1994) 2680-2685.
- For additional information see C.A.:
- 121 (1994) 49341t.
- See also 79, 1247.
- ### 5c. Halogen derivatives
- 201 Mössner, S., Barudio, I., Spraker, T.S., Antonelis, G., Early, G., Geraci, J.R., Becker, P.R. and Ballschmiter, K.: Determination of HCHs, PCBs and DDT in brain tissues of marine mammals of different age. *Fresenius J. Anal. Chem.*, 349 (1994) 708-716.
- See also 85, 1238.
- ### 5d. Complex hydrocarbon mixtures (incl. analysis of tars, bitumens and mineral oils)
- 202 Akhlaq, M.S. and Götze, P.: Detailed analysis of crude oil group types using reversed-phase high-performance liquid chromatography. *J. Chromatogr. A.*, 677 (1994) 265-272.

- 203 Kelly, G.W. and Bartle, K.D.: The use of combined LC-GC for the analysis of fuel products: a review. *J. High Resolut. Chromatogr.*, 17 (1994) 390-397 - a review with 25 refs.
 204 Trisciani, A. and Munari, E.: Characterization of fuel samples by on-line LC-GC with automatic group-type separation of hydrocarbons. *J. High Resolut. Chromatogr.*, 17 (1994) 452-456.

See also 185.

6. ALCOHOLS

- 205 Kim, J.-H., Uzawa, H., Nishida, Y., Ohrui, H. and Meguro, H.: Highly sensitive high-performance liquid chromatographic method for the determination of the absolute configuration and the optical purity of di-O-acylglycerols using a chiral derivatizing agent, (S)-(+)-2-tert.-butyl-2-methyl-1,3-benzodioxole-4-carboxylic acid. *J. Chromatogr. A*, 677 (1994) 35-43.
 206 Marko-Varga, G., Johansson, K. and Gorton, L.: A reagentless coimmobilized alcohol biosensor as a detection unit in column liquid chromatography for the determination of methanol and ethanol. *Quim. Anal. (Barcelona)*, 12 (1993) 24-29; C.A., 121 (1994) 197750r.
 207 Multzsch, R., Lokotsch, W., Steffen, B., Lang, S., Metzger, J.O., Schäfer, H.J., Warwel, S. and Wagner, F.: Enzymatic production and physicochemical characterization of uncommon wax esters and monoglycerides. *J. Am. Oil Chem. Soc.*, 71 (1994) 721-725.

See also 321.

7. PHENOLS

- 208 Ariese, F., Verkaik, M., Hoornweg, G.P., van de Nesse, R.J., Jukema-Leenstra, S.R., Hofstraat, J.W., Gooijer, C. and Velthorst, N.H.: Trace analysis of 3-hydroxy benzo[a]pyrene in urine for the biomonitoring of human exposure to polycyclic aromatic hydrocarbons. *J. Anal. Toxicol.*, 18 (1994) 195-204.
 209 Baiocchi, C., Marengo, E., Roggero, M.A., Giacosa, D., Vietto, L. and Toccori, S.: A chromatographic and chemometric study of the bark phenolic compounds of two polar clones with different resistance to *Discosporium populem*. *Chromatographia*, 39 (1994) 481-489.
 210 Brouwer, E.R. and Brinkman, U.A.T.: Determination of phenolic compounds in surface water using on-line liquid chromatographic precolumn-based column-switching techniques. *J. Chromatogr. A*, 678 (1994) 223-231.
 211 Galvez, M.C., Barroso, C.G. and Perez-Bustamante, J.A.: Analysis of polyphenolic compounds of different venegar samples. *Z. Lebensm.-Unters. Forsch.*, 199 (1994) 29-31; C.A., 121 (1994) 132513w.
 212 Levin, S., Abu-Lafi, S., Golshan-Shirazi, S. and Guiochon, G.: Use of system peaks for the determination of the distribution of resorcinol, catechol and phenol in liquid chromatography. *J. Chromatogr. A*, 679 (1994) 213-229.

- 213 Lipniak, M., Gawlik, M., Madej, J. and Niezabitowski, P.: Determination of 1-hydroxypyrene in rat urine using liquid extraction and HPLC UV-detection method. *Chem. Anal. (Warsaw)*, 39 (1994) 29-32; C.A., 121 (1994) 28665m.
 214 Liu, C.Y., Chang, C.H., Chyuch, S.D. and Hu, C.C.: Combination of chelating behaviour with molecular recognition as interaction for ligand exchange chromatography. *Fresenius J. Anal. Chem.*, 350 (1994) 132-134.
 215 Mannino, S., Cosio, M.S. and Bertuccoli, M.: High-performance liquid chromatography of phenolic compounds in virgin olive oil using amperometric detection. *Ital. J. Food Sci.*, 5 (1993) 363-370; C.A., 121 (1994) 81193g.
 216 Ruban, V.F.: (Determination of phenols in drinking water by capillary HPLC with electrochemical detection). *Zh. Ekol. Khim.*, 1 (1993) 45-49; C.A., 121 (1994) 163545n.
 217 Wang, M. and Chen, T.: (Separation of tannin and saponin from Sanguisorba by liquid chromatography). *Sepu*, 12 (1994) 305; C.A., 121 (1994) 152471j.
 218 Yoshimura, I., Kinoshita, Y., Yamamoto, Y., Huneck, S. and Yamada, Y.: Analysis of secondary metabolites from lichen by high performance liquid chromatography with a photodiode array detector. *Phytochem. Anal.*, 5 (1994) 197-205; C.A., 121 (1994) 199918a.

For additional information see C.A.:
 121 (1994) 148051e, 194612m.

See also 194, 326, 425, 1209, 1228.

8. SUBSTANCES CONTAINING HETERO CYCLIC OXYGEN

- 219 Barnes, A.R., Bradley, C.R. and Nash, S.: Comparison of methods for the determination of glutaraldehyde in solution. *Pharm. Acta Helv.*, 69 (1994) 21-24; C.A., 121 (1994) 141889a.
 8a. Flavonoids
 220 Ferreres, F., Tomas-Barberan, F.A., Soler, C., Garcia-Viguera, C., Ortiz, A. and Tomas-Lorente, F.: A simple extractive technique for honey flavonoid HPLC analysis. *Apidologie*, 25 (1994) 21-30; C.A., 121 (1994) 132480h.
 221 Males, Z., Medic-Saric, M. and Kustrak, D.: Application of numerical methods in the investigation of the flavonoids of Christ's thorn (*Paliurus spina-christi* Mill.). *Acta Pharm. (Zagreb)*, 44 (1994) 183-191; C.A., 121 (1994) 200945r.
 222 Pietta, P.G., Mauri, P.L. and Gardana, C.: Identification of the main flavonoids by use of chromatographic, electrophoretic, and 'on-line' spectral data. *J. High Resolut. Chromatogr.*, 17 (1994) 616-618.
 223 Rehwald, A., Meier, B. and Sticher, O.: Qualitative and quantitative reversed-phase high-performance liquid chromatography of flavonoids in *Crataegus* leaves and flowers. *J. Chromatogr. A*, 677 (1994) 25-33.
 224 Shihabi, Z.K., Kute, T., Garcia, L.L. and Hinsdale, M.: Analysis of isoflavones by capillary electrophoresis. *J. Chromatogr. A*, 680 (1994) 181-185.

- 225 Zhang, X. and Chen, Y.: (Determination of quercetin in extract of *Ginkgo biloba* L. leaves by high performance liquid chromatography). *Sepu.*, 12 (1994) 302-303; *C.A.*, 121 (1994) 152470h.

For additional information see *C.A.*:
121 (1994) 164090x.

See also 9, 416.

8b. Aflatoxins and other mycotoxins

- 226 Huang, H., Zhao, Z. and Li, Y.: (Simultaneous determination of aflatoxin B₁ and sterigmatocystin in feeds by high performance liquid chromatography). *Sepu.*, 12 (1994) 299-300; *C.A.*, 121 (1994) 156062z.
- 227 Jordan, L., Hansen, T.J. and Zabe, N.A.: Automated mycotoxin analysis. *Am. Lab. (Shelton)*, 26 (1994) 18-24; *C.A.*, 121 (1994) 156029u.
- 228 Kok, W.T.: Derivatization reactions for the determination of aflatoxins by liquid chromatography with fluorescence detection. *J. Chromatogr. B*, 659 (1994) 127-137 - a review with 76 refs.
- 229 Lawrence, J.F. and Scott, P.M.: HPLC methods for the determination of mycotoxins and phycotoxins. *Tech. Instrum. Anal. Chem.*, 13(Environmental Analysis) (1993) 273-309; *C.A.*, 121 (1994) 28656j - a review with 174 refs.
- 230 Luo, Y., Liu, F., Hu, X., Feng, J. and Yang, J.: (High performance liquid chromatography study on fusarium mycotoxins, fusarochromanone and zearalenone, in cereals). *Sepu.*, 12 (1994) 197-199; *C.A.*, 121 (1994) 156074e.
- 231 Mallmann, C.A., Santurio, J.M., Baldissera, M.A. and von Mickwitz, G.: Determination of ochratoxin A in blood serum of pigs by using thin-layer chromatography. *Rev. Microbiol.*, 25 (1994) 107-111; *C.A.*, 121 (1994) 172378n.
- 232 Solfrizzo, M., Forbes-Smith, M., Strange, R.N. and Visconti, A.: Separation of chlamydosporol epimers by reversed-phase HPLC using commercial solvent optimisation software. *Chromatographia*, 39 (1994) 443-447.
- 233 Stresser, D.M., Bailey, G.S. and Williams, D.E.: Indole-3-carbinol and β-naphthoflavone induction of aflatoxin B₁ metabolism and cytochromes P-450 associated with bioactivation detoxication of aflatoxin B₁ in the rat. *Drug Metab. Disp.*, 22 (1994) 383-391.
- 234 Stresser, D.M., Williams, D.E., McLellan, L.I., Harris, T.M. and Bailey, G.S.: Indole-3-carbinol induces a rat liver glutathione transferase subunit (YC2) with high activity toward aflatoxin B₁ exo-epoxide. Association with reduced levels of hepatic aflatoxin-DNA adducts *in vivo*. *Drug Metab. Disp.*, 22 (1994) 392-399.
- 235 Xu, Y. and Mirocha, C.J.: Analysis of wortmannin (H-1) by liquid chromatography and gas chromatography. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 942-947.

8c. Other compounds with heterocyclic oxygen (incl. tannins)

- 236 Risner, C.H.: The determination of scopoletin in environmental tobacco smoke by high-performance liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2723-2736.

- 237 Suzuki, T.: High-performance liquid chromatographic resolution of dinophysistoxin-1 and free fatty acids as 9-anthrylmethyl esters. *J. Chromatogr. A*, 677 (1994) 301-306.

- 238 Xu, H. and Zhou, Z.H.: Studies on separation and determination of the coumarins in *Murraya paniculata* (L.) Jack by RP-HPLC. *Chin. Chem. Lett.*, 5 (1994) 313-314; *C.A.*, 121 (1994) 174256v.

See also 77.

9. OXO COMPOUNDS, ETHERS, EPOXIDES AND QUINONES

- 239 Baj, S.: Quantitative determination of organic peroxides. *Fresenius J. Anal. Chem.*, 350 (1994) 159-161.
- 240 Carboneau, M.A., Sess, D., Peuchant, E., Receveur, M.C., Dubourg, L., Thomas, M.J., Perrotat, A. and Clerc, M.: Comparison of methods evaluating lipoperoxidation in plasma of malaria patients. *J. Liq. Chromatogr.*, 17 (1994) 2247-2272.
- 241 Corradini, C. and Corradini D.: Determination of 5-hydroxymethyl-2-furaldehyde in honey by micellar electrokinetic capillary chromatography. *J. Microcolumn Sep.*, 6 (1994) 19-22; *C.A.*, 121 (1994) 132496t.
- 242 Huang, Y., Zhang, Z. and Liao, G.: (Aspect of studies on determination of the anthraquinone derivatives in rheum and its compound preparations). *Huaxi Yaoxue Zazhi*, 9 (1994) 107-110; *C.A.*, 121 (1994) 164074v - a review with 18 refs.
- 243 Husain, S., Narsimha, R., Khalid, S. and Rao, R.N.: Application of normal- and reversed-phase high-performance liquid chromatography for monitoring the progress of reactions of anthraquinone manufacturing processes. *J. Chromatogr. A*, 679 (1994) 375-380.
- 244 Lores, M., García, C.M. and Cela, R.: High-performance liquid chromatography of phenolic aldehydes with highly selective fluorimetric detection by means of postcolumn photochemical derivatization. *J. Chromatogr. A*, 683 (1994) 31-44.
- 245 Neidigh, K.A., Kingston, D.G.I. and Lewis, N.G.: Synthesis of stereospecifically deuterated metaresinol, podorhizol, epipodorhizol and yatein. *J. Natural Prod.*, 57 (1994) 791-800.
- 246 Rivera, M.I., Hinojosa, L.M., Hill, B.A., Lau, S.S. and Monks, T.J.: Metabolism and toxicity of 2-bromo(diglutathion-S-yl)-hydroquinone and 2-bromo-3-(glutathion-S-yl)hydroquinone in the *in situ* perfused rat kidney. *Drug Metab. Disp.*, 22 (1994) 503-510.
- 247 Thies, F. and Grimme, L.H.: *In vivo* O-dealkylation of resorufin and coumarin ethers by the green alga *Chlorella fusca* analysed by a rapid and sensitive high-performance liquid chromatographic assay. *J. Chromatogr. A*, 684 (1994) 168-173.

For additional information see *C.A.*:
121 (1994) 5160x, 187395q.

See also 194, 905.

10. CARBOHYDRATES

See 157.

10a. Mono and oligosaccharides. Structural studies

- 248 Anumula, R.: Quantitative determination of monosaccharides in glycoproteins by high-pressure liquid chromatography with highly sensitive fluorescence detection. *Anal. Biochem.*, 220 (1994) 275-283.
- 249 Baenziger, J.U.: High-performance liquid chromatography of oligosaccharides. *Methods Enzymol.*, 230(Guide to Techniques) (1994) 237-249; C.A., 121 (1994) 53275s.
- 250 Berry, M.N., Gregory, R.B., Grivell, A.R., Phillips, J.W. and Schön, A.: The capacity of reducing-equivalent shuttles limits glycolysis during ethanol oxidation. *Eur. J. Biochem.*, 225 (1994) 557-564.
- 251 Chusney, G.D. and Pickup, J.C.: Serum 1,5-anhydro-D-glucitol assay by high-performance anion-exchange chromatography. *Br. J. Biomed. Sci.*, 51 (1994) 18-23; C.A., 121 (1994) 129035m.
- 252 Frias, J., Hedley, C.L., Price, K.R., Fenwick, G.R. and Vidal-Valverde, C.: Improved methods of oligosaccharide analysis for genetic studies of legume seeds. *J. Liq. Chromatogr.*, 17 (1994) 2469-2483.
- 253 Fujii, E., Iwase, H., Ishii-Karakasa, I., Yajima, Y. and Hotta, K.: Quantitation of the glycation intermediate 3-deoxyglucosone by oxidation with rabbit liver oxaloaldehyde dehydrogenase to 2-keto-3-deoxygluconic acid followed by high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 265-270.
- 254 Guile, G.R., Wong, S.Y.C. and Dwek, R.A.: Analytical and preparative separation of anionic oligosaccharides by weak anion-exchange high-performance liquid chromatography on an inert polymer column. *Anal. Biochem.*, 222 (1994) 231-235.
- 255 Hase, S.: High-performance liquid chromatography of pyridyl-aminated saccharides. *Methods Enzymol.*, 230(Guide to Techniques) (1994) 225-237; C.A., 121 (1994) 53274r.
- 256 Honda, S., Chikada, N., Suzuki, S. and Kakehi, K.: (Ion-pair liquid chromatography of oligosaccharide derivatives). *Kuromatografi*, 14 (1993) 78-79; C.A., 121 (1994) 129034k.
- 257 Izumi, J., Takagaki, K., Nakamura, T., Shibata, S., Kojima, K., Kato, I. and Endo, M.: A novel oligosaccharide, xylosyl β 1-4xylosyl β 1-(4-methylumbelliferon), synthesized by cultured human skin fibroblasts in the presence of 4-methylumbelliferyl- β -D-xyloside. *J. Biochem. (Tokyo)*, 116 (1994) 524-529.
- 258 Kirino, J., Kadoya, J. and Kamata, Y.: Fractionation and purification of laminarioligosaccharides. *Jpn. Kokai Tokkyo Koho*, JP 06,145,185 [94,145,185] (Cl. C07H1/08), 24 May 1994, Appl. 92/295,725, 05 Nov. 1992; 4 pp.; C.A., 121 (1994) 109568j.
- 259 Klockow, A., Paulus, A., Figueiredo, V., Amadò, R. and Widmer, H.M.: Determination of carbohydrates in fruit juices by capillary electrophoresis and high-performance liquid chromatography. *J. Chromatogr. A*, 680 (1994) 187-200.
- 260 Kobata, A.: Size fractionation of oligosaccharides. *Methods Enzymol.*, 230(Guide to Techniques) (1994) 200-208; C.A., 121 (1994) 53272p.
- 261 Kudo, K., Kondo, N. and Hibi, K.: (Reinvestigation of silica-NH₂ sugar analysis. II. Study of analytical conditions). *Kuromatografi*, 14 (1993) 80-81; C.A., 121 (1994) 30139m.
- 262 Lindqvist, L., Schweda, K.H., Reeves, P.R. and Lindberg, A.A.: *In vitro synthesis of CDP-D-abequose using Salmonella enzymes of cloned rfb genes. Production of CDP-6-deoxy-D-xylo-4-hexylose, CDP-3,6-dideoxy-D-xylo-4-hexylose and CDP-3,6-dideoxy-D-galactose, and isolation by HPLC*. *Eur. J. Biochem.*, 225 (1994) 863-872.
- 263 Low, N.H., Brause, A. and Wilhelmsen, E.: Normative data for commercial pineapple juice from concentrate. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 965-975.
- 264 Namba, N., Watanabe, F., Tokuda, M., Mino, M. and Furuya, E.: A new method of quantitating serum and urinary levels of 1,5-anhydroglucitol in insulin-dependent diabetes mellitus. *Diabetes Res. Clin. Pract.*, 24 (1994) 55-61; C.A., 121 (1994) 199929c.
- 265 Schols, H.A., Mutter, M., Voragen, A.G.J., Niessen, W.M.A., van der Hoeven, R.A.M., van der Greef, J. and Bruggink, C.: The use of combined high-performance anion-exchange chromatography-thermospray mass spectrometry in the structural analysis of pectic oligosaccharides. *Carbohydr. Res.*, 261 (1994) 335-342; C.A., 121 (1994) 178069j.
- 266 Schwaiger, H., Oefner, P.J., Huber, C., Grill, E. and Bonn, G.K.: Capillary zone electrophoresis and micellar electrokinetic chromatography of 4-aminobenzonitrile carbohydrate derivatives. *Electrophoresis (Weinheim)*, 15 (1994) 941-952.
- 267 Strydom, D.J.: Chromatographic separation of 1-phenyl-3-methyl-5-pyrazolone-derivatized neutral, acidic and basic aldehydes. *J. Chromatogr. A*, 678 (1994) 17-23.
- 268 Su, W., Gregory, R.B. and Gilpin, R.K.: LC studies of the mutarotation of α - and β -N,N'-diacetylchitobiose using silica-immobilized lysozyme as the stationary phase. *J. Chromatogr. Sci.*, 32 (1994) 279-281.
- 269 Swallow, K.W. and Low, N.H.: Determination of honey authenticity by anion-exchanged liquid chromatography. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 695-702.
- 270 Theander, O., Arman, P., Westerlund, E. and Graham, H.: Enzymatic/chemical analysis of dietary fiber. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 703-709.
- 271 Timmermans, J.W., van Leeuwen, M.B., Tournois, H., de Wit, D. and Vliegenthart, J.F.G.: Quantitative analysis of the molecular weight distribution of inulin by means of anion-exchange HPLC with pulsed amperometric detection. *J. Carbohydr. Chem.*, 13 (1994) 881-888; C.A., 121 (1994) 136509x.
- 272 Wu, W., Luo, L. and Yu, S.: (High performance liquid chromatographic analysis of plant monosaccharides). *Separ.*, 12 (1994) 210-211; C.A., 121 (1994) 152475p.
- 273 Yamada, H., Miyata, S., Igaki, N., Yatabe, H., Miyauchi, Y., Ohara, T., Sakai, M., Shoda, H., Oimomi, M. and Kasuga, M.: Increase in 3-deoxyglucosone levels in diabetic rat plasma. Specific *in vivo* determination of intermediate in advanced Maillard reaction. *J. Biol. Chem.*, 269 (1994) 20275-20280.

For additional information see C.A.:
121 (1994) 18990z, 178007n.

See also 65, 68, 277, 280, 281, 287, 290, 331, 356, 373, 827, 841, 1001, 1232.

- 10b. *Polysaccharides, mucopolysaccharides, lipopolysaccharides*
- 274 Barne, K.J., Zhang, L., David, G. and Esko, J.D.: Sulphated and undersulphated heparan sulphate proteoglycans in a Chinese hamster ovary cell mutant defective in N-sulphotransferase. *Biochem. J.*, 303 (1994) 81-87.
- 275 Bourgerie, S., Berger, S., Strecker, G., Julien, R. and Karamanos, Y.: A fluorescence high-performance liquid chromatography assay for enzymes acting on the di-N-acetylchitobiosyl part of asparagine-linked glycans. *J. Biochem. Biophys. Methods*, 28 (1994) 283-293; C.A., 121 (1994) 173494j.
- 276 Chiu, T.-h. and Baker, J.J.: Lipoteichoic acid from *Streptococcus sanguis* is a natural glucosyl acceptor for glucosyltransferases. *Biochem. Biophys. Res. Commun.*, 202 (1994) 1407-1412.
- 277 Gamian, A., Kenne, L., Mieszala, M., Ulrich, J. and Defaye, J.: Structure of the *Escherichia coli* O24 and O56 O-specific sialic-acid-containing polysaccharides and linkage of these structures to the core region in lipopolysaccharides. *Eur. J. Biochem.*, 225 (1994) 1211-1220.
- 278 Hepler, R.W. and Ip, C.C.Y.: Application of capillary ion electrophoresis and ion chromatography for the determination of O-acetate groups in bacterial polysaccharides. *J. Chromatogr. A*, 680 (1994) 201-208.
- 279 Hong, Z., Mann, P., Shaw, K.J. and Didomenico, B.: Analysis of β -glucans and chitin in a *Saccharomyces cerevisiae* cell wall mutant using high-performance liquid chromatography. *Yeast*, 10 (1994) 1083-1092; C.A., 121 (1994) 17427c.
- 280 Karamanos, N.K., Syrokou, A., Vanký, P., Nurminen, M. and Hjerpe, A.: Determination of 24 variously sulfated galactoamino-glycan- and hyaluronan-derived disaccharides by high-performance liquid chromatography. *Anal. Biochem.*, 221 (1994) 189-199.
- 281 Lauder, R.M., Huckerby, T.M. and Nieduszynski, I.A.: Structure of the keratan sulphate chains attached to fibromodulin isolated from bovine tracheal cartilage. Oligosaccharides generated by keratanase digestion. *Biochem. J.*, 302 (1994) 417-423.
- 282 Lou, J., Myers, M.N. and Giddings, J.C.: Separation of polysaccharides by thermal field-flow fractionation. *J. Liq. Chromatogr.*, 17 (1994) 3239-3260.
- 283 Manzi, A.E., Higa, H.H., Diaz, S. and Varki, A.: Intramolecular self-cleavage of polysialic acid. *J. Biol. Chem.*, 269 (1994) 23617-23624.
- 284 Matsumura, S., Aoki, K. and Toshima, K.: Builder performance in detergent formulations and biodegradability of partially dicarboxylated amylopectin. *J. Am. Oil Chem. Soc.*, 71 (1994) 749-755.
- 285 Misra, K.B., Kim, K.C., Cho, S., Low, M.G. and Bensadoun, A.: Purification and characterization of adipocyte heparan sulfate proteoglycans with affinity for lipoprotein lipase. *J. Biol. Chem.*, 269 (1994) 23838-23844.
- 286 Mulloy, B., Ribeiro, A.-C., Alves, A.-P., Vieira, R.P. and Mourao, P.A.S.: Sulfated fucans from echinoderms have a regular tetrasaccharide repeating unit defined by specific patterns of sulfation at the O-2 and O-4 positions. *J. Biol. Chem.*, 269 (1994) 22113-22123.
- 287 Neidhart, S., Gessler, A., Hannak, C., Endress, H.U. and Gierschner, K.: (Application of analytical-size exclusion chromatography to the investigation of substrate degradation by a commercial pectate lyase from *Erwinia carotovora*). *Z. Lebensm.-Unters. Forsch.*, 198 (1994) 317-324; C.A., 121 (1994) 173630a.
- 288 Oliveira, F.W., Chavante, S.F., Santos, E.A., Dietrich, C.P. and Nader, H.B.: Appearance and fate of a β -galactanase, α , β -galactosidases, heparan sulfate and chondroitin sulfate degrading enzymes during embryonic development of the mollusc *Pomacea sp.*. *Biochim. Biophys. Acta*, 1200 (1994) 241-248.
- 289 Orvinsky, E., Soltes, L. and Al Assaf, S.: Concentration effect in hyaluronan analysis by size exclusion chromatography. *Chromatographia*, 39 (1994) 366-368.
- 290 Papakonstantinou, E., Karakiulakis, G., Aletras, A.J. and Misevic, G.N.: A novel class of adhesion acidic glycans in sea urchin embryos. Isolation, characterization a immunological studies during early embryonal development. *Eur. J. Biochem.*, 224 (1994) 1067-1077.
- 291 Politz, M.L., Timpa, J.D., White, A.R. and Wasserman, B.P.: Nonaqueous gel permeation chromatography of wheat starch in dimethylacetamide (DMAc) and LiCl: extrusion-induced fragmentation. *Carbohydr. Polym.*, 24 (1994) 91-99; C.A., 121 (1994) 178045y.
- 292 Reantragoon, S., Arrigo, L.M., Abou Seoud, M.M., Dweck, H.S. and Rosenfeld, L.: Specific heparin fractions suppress endothelin-1 production in cultured human umbilical vein endothelial cells. *Arch. Biochem. Biophys.*, 314 (1994) 315-322.
- 293 Redman, C.A., Thomas-Oates, J.E., Ogata, S., Ikebara, Y. and Ferguson, M.A.: Structure of the glycosylphosphatidylinositol membrane anchor of human placental alkaline phosphatase. *Biochem. J.*, 302 (1994) 861-865.
- 294 Takagaki, K., Takeda, Y., Nakamura, T., Didouji, K., Narita, H. and Endo, M.: Analysis of glycosaminoglycans by high-performance liquid chromatography. *J. Biochem. Biophys. Methods*, 28 (1994) 313-320; C.A., 121 (1994) 152466m.
- 295 Thomas, G.J., Bayliss, M.T., HarOer, K., Mason, R.M. and Davies, M.: Glomerular mesangial cells *in vitro* synthesize an aggregating proteoglycan immunologically related to versican. *Biochem. J.*, 302 (1994) 49-56.
- 296 Tsai, C.-M., Gu, X.-X. and Byrd, R.A.: Quantification of polysaccharide in *Haemophilus influenzae* type b conjugate and polysaccharide vaccines by high-performance anion-exchange chromatography with pulsed amperometric detection. *Vaccine*, 12 (1994) 700-706; C.A., 112 (1994) 141833c.
- For additional information see C.A.:
121 (1994) 174255u.
- See also 30, 271, 828, 841.
- 10c. *Glycoproteins and their constituents*
- 297 Agarwala, K.L., Kawabata, S., Takao, T., Murata, H., Shimonishi, Y., Nishimura, H. and Iwanaga, S.: Activation peptide of human factor IX has oligosaccharides O-glycosidically linked to threonine residues at 159 and 169. *Biochemistry*, 33 (1994) 5167-5171.

- 298 Belew, M., Zhou, Y., Wang, S., Nyström, L.-E. and Janson, J.-C.: Purification of recombinant human granulocyte-macrophage colony-stimulating factor from the inclusion bodies produced by transformed *Escherichia coli* cells. *J. Chromatogr. A.*, 679 (1994) 67-83.
- 299 Etzler, M.E.: Isolation and characterization of subunits of DB58, a lectin from the stems and leaves of *Dolichos biflorus*. *Biochemistry*, 33 (1994) 9778-9783.
- 300 Gilljam, G.: Envelope glycoproteins of HIV-2, and SIV purified with *Galanthus nivalis* agglutinin induce strong immune responses. *AIDS Res. Hum. Retroviruses*, 9 (1993) 431-438; C.A., 121 (1994) 32647z.
- 301 Hardy, M.R. and Townsend, R.R.: High-pH anion-exchange chromatography of glycoprotein-derived carbohydrates. *Methods Enzymol.*, 230(Guide to Techniques) (1994) 208-225; C.A., 121 (1994) 53273q.
- 302 Kato, J. and Izumi, T.: (Glycoprotein analysis by gel permeation chromatography combined with low-angle laser light scattering detection. Approach to carbohydrate content estimation). *Kuromatogurafu*, 14 (1993) 84-85; C.A., 121 (1994) 30140e.
- 303 Kitazume, S., Kitajima, K., Inoue, S., Troy, II, F.A., Cho, J., Leniarz, W.J. and Inoue, Y.: Identification of polysialic acid-containing glycoprotein in the jelly coat of sea urchin eggs. Occurrence of a novel type of polysialic acid structure. *J. Biol. Chem.*, 269 (1994) 22712-22718.
- 304 Konka, G., Guillot, J., Dusser, M., Damez, M. and Bottom, B.: Isolation and characterization of an N-acetyllactosamine-binding lectin from the mushroom *Laetiporus sulfureus*. *J. Biochem. (Tokyo)*, 116 (1994) 519-523.
- 305 Montano, L.F., Masso, F., Paez, A., Sandoval, S., Vazquez, L., Sanchez, L., Fournet, B. and Zenteno, E.: Isolation of a 32 kDa *Mycobacterium tuberculosis* protein by lectin affinity chromatography. *Comp. Biochem. Physiol., B: Biochem. Mol. Biol.*, 108B (1994) 265-272; C.A., 121 (1994) 129045q.
- 306 Noguchi, S., Yonezawa, N., Katsumata, T., Hashizume, K.-i., Kuwayama, M., Hamano, S., Watanabe, S. and Nakano, M.: Characterization of the zona pellucida glycoproteins from bovine ovarian and fertilized eggs. *Biochim. Biophys. Acta*, 1201 (1994) 7-14.
- 307 Qian, R., Shi, W.X., Shen, Z.M. and Sun, C.: A mannose-specific lectin from *Vicia villosa* seeds. *Biochim. Biophys. Acta*, 1201 (1994) 61-68.
- 308 Rusiniak, M., Bedi, G.S. and Back, N.: The carbohydrate structure of the asparagine-linked oligosaccharides of rat plasma thiostatin. *Biochim. Biophys. Acta*, 1208 (1994) 316-323.
- 309 Sareneva, T., Pirhonen, J., Cantell, K., Kalkkinen, N. and Julkunen, I.: Role of N-glycosylation in the synthesis, dimerization and secretion of human interferon- γ . *Biochem. J.*, 303 (1994) 831-840.
- 310 Steinfort, J., van de Stadt, R. and Beertsen, W.: Identification of new rat dentin proteoglycans utilizing C18 chromatography. *J. Biol. Chem.*, 269 (1994) 22397-22404.
- 311 Tezuka, T., Taguchi, T., Kanamori, A., Muto, Y., Kitajima, K., Inoue, Y. and Inoue, S.: Identification and structural determination of the KDN-containing N-linked glycan chains consisting of bi- and triantennary complex-type units of KDN-glycoprotein previously isolated from rainbow trout vitelline envelopes. *Biochemistry*, 33 (1994) 6495-6502.
- 312 Villalobos, A.P., Ivancic, J.S. and Halsall, H.B.: The lipocalin model for human orosomucoid: support for the chromatography of orosomucoid-monoclonal antibody complexes. *Chromatographia*, 39 (1994) 475-480.
- 313 Yost, J.C., Bell, A., Seale, R. and Sabe, E.H.: Purification of biologically active SPARC expressed in *Saccharomyces cerevisiae*. *Arch. Biochem. Biophys.*, 314 (1994) 50-63.
- 314 Zenteno, E., Ortega, M., Qin, Z., Montreuil, J. and Debray, H.: Fast purification of *Phaseolus vulgaris* isolectins. *Prepar. Biochem.*, 24 (1994) 175-183.

See also 141, 585, 638.

11. ORGANIC ACIDS AND LIPIDS

11a. Organic acids and simple esters

- 315 Abushufa, R., Reed, P. and Weinkove, C.: Fatty acids in erythrocytes measured by isocratic HPLC. *Clin. Chem. (Washington)*, 40 (1994) 1707-1712.
- 316 Alexander-North, L.S., North, J.A., Kiminyo, K.P., Buettner, G.R. and Spector, A.S.A.: Polyunsaturated fatty acids increase lipid radical formation induced by oxidant stress in endothelial cells. *J. Lipid Res.*, 35 (1994) 1773-1785.
- 317 Ashton, I., Clements, K., Barrow, S.E., Secombes, C.J. and Rowley, A.F.: Effects of dietary fatty acids on eicosanoid-generating capacity, fatty acid composition and chemotactic activity of rainbow trout (*Oncorhynchus mykiss*) leucocytes. *Biochim. Biophys. Acta*, 1214 (1994) 253-262.
- 318 Bennat, C., Engelhardt, U.H., Kiehne, A., Wirries, F.M. and Maier, H.G.: HPLC analysis of chlorogenic acid lactones in roasted coffee. *Z. Lebensm.-Unters. Forsch.*, 199 (1994) 17-21; C.A., 121 (1994) 178291a.
- 319 Bordier, C.G., Sellier, N., Foucault, A.P. and le Goffic, F.: Characterization and purification of fatty acid methyl esters from the liver oil of the deep sea shark (*Centrophorus squamosus*) by gas chromatography-mass spectrometry and countercurrent chromatography. *Chromatographia*, 39 (1994) 329-338.
- 320 Brutting, R. and Spitteler, G.: Produkte der Dimerisierung ungesättigter Fettsäuren XI: Die Fraktion der alicyclischen Dimersfettsäuren. *Fat Sci. Technol.*, 96 (1994) 361-370.
- 321 Busson-Breysse, J., Farines, M. and Soulier, J.: Jojoba wax: its esters and some of its minor components. *J. Am. Oil Chem. Soc.*, 71 (1994) 999-1002.
- 322 Cardwell, T.J. and Laughton, W.R.: Analysis of fluoride, acetate and formate in Bayer liquors by ion chromatography. *J. Chromatogr. A*, 678 (1994) 364-369.
- 323 Christie, W.W.: Preparation of ester derivatives of fatty acids for chromatographic analysis. In: Christie, W.W. (Editor), *Adv. Lipid Methodol. - Two*, Oily Press, Dundee, 1993, pp. 69-111; C.A., 121 (1994) 128960x - a review with 370 refs.
- 324 Dzido, T.H. and Smolarz, H.D.: Preliminary computer simulation for fine tuning of the high-performance liquid chromatography of some phenolic acids. *J. Chromatogr. A*, 679 (1994) 59-66.
- 325 Fritsch, H., Molnar, I. and Wurl, M.: Separation of arachidonic acid metabolites by on-line extraction and reversed-phase high-performance liquid chromatography optimized by computer simulation. *J. Chromatogr. A*, 684 (1994) 65-75.

- 326 Garcia-Parrilla, M.C., Camacho, M.L., Heredia, F.J. and Troncoso, A.M.: Separation and identification of phenolic acids in wine vinegars by HPLC. *Food Chem.*, 50 (1994) 313-315; C.A., 121 (1994) 56093s.
- 327 George, E.D.: Fatty acid distribution of fats, oils and soaps by high-performance liquid chromatography without derivatization. *J. Am. Oil Chem. Soc.*, 71 (1994) 789-791.
- 328 Haginaka, J., Murashima, T. and Seyama, C.: Retention and enantioselectivity of 2-arylpropionic acid derivatives on an avidin-bonded silica column. Influence of base materials, spacer type and protein modification. *J. Chromatogr. A*, 677 (1994) 229-237.
- 329 Kahsai, T.Z. and Matthees, D.P.: Determination of mycophenolic acid in feed materials by high-performance liquid chromatography. *Microchem. J.*, 50 (1994) 48-50; C.A., 121 (1994) 156066d.
- 330 Kasuya, F., Igarashi, K. and Fukui, M.: Evaluation of liquid chromatography-ion spray mass spectrometry for the determination of substituted benzoic acids and their glycine conjugates. *J. Chromatogr. A*, 684 (1994) 93-101.
- 331 Kaufmann, A.: (Survey and application of HPLC analysis of acids and sugars in wine). *Mitt. Geb. Lebensmittelunters. Hyg.*, 84 (1993) 311-333; C.A., 121 (1994) 155951b.
- 332 Kaysinger, K.K., Pierce, W.M., Jr. and Nerland, D.E.: Quantitative analysis of 2-oxoglutarate in biological samples using liquid chromatography with electrochemical detection. *Anal. Biochem.*, 222 (1994) 81-85.
- 333 Keeley, W.T., Coffey, D.L. and Mueller, T.C.: Liquid chromatographic determination of phenolic acids in soil. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 805-809.
- 334 Kuhn, H., Belkner, J., Suzuki, H. and Yamamoto, S.: Oxidative modification of human lipoproteins by lipoxygenases of different positional specificities. *J. Lipid Res.*, 35 (1994) 1749-1759.
- 335 Li, B., Birdwell, C. and Whelan, J.: Antithetic relationship of dietary arachidonic acid and eicosapentaenoic acid in eicosanoid production *in vivo*. *J. Lipid Res.*, 35 (1994) 1869-1877.
- 336 Madigan, D., McMurrough, I. and Smyth, M.R.: Determination of oxalate in beer and beer sediments using ion chromatography. *J. Am. Soc. Brew. Chem.*, 52 (1994) 134-137; C.A., 121 (1994) 178027u.
- 337 Marcomini, A., Tortato, C., Capri, S. and Liberatori, A.: Preparation, characterization and RP-HPLC determination of sulphonophenyl and nonylphenoxy carboxylates. *Ann. Chim. (Rome)*, 83 (1993) 461-484; C.A., 121 (1994) 49420t.
- 338 Matsumoto, K., Ichitani, Y., Ogasawara, N., Yuki, H. and Imai, K.: Precolumn fluorescence derivatization of carnitine and acylcarnitines with 4-(2-aminoethylamino)-7-nitro-2,1,3-benzodiazole prior to high-performance liquid chromatography. *J. Chromatogr. A*, 678 (1994) 241-247.
- 339 Matsuo, Y., Yagi, M. and Walser, M.: Arteriovenous differences and tissue concentrations of branched-chain ketoacids. *J. Lab. Clin. Med.*, 121 (1993) 779-784; C.A., 121 (1994) 152451c.
- 340 Norton, R.A.: Isolation and identification of sterol cinnamic acid derivatives from corn bran. *Cereal Chem.*, 71 (1994) 111-117; C.A., 121 (1994) 56056g.
- 341 Radin, L., Pronzato, C., Casareto, L. and Calegari, L.: Tartaric acid in wines may be useful for preventing renal calculi: rapid determination by HPLC. *J. Liq. Chromatogr.*, 17 (1994) 2231-2246.
- 342 Ramos, L.S.: Characterization of mycobacteria species by HPLC and pattern recognition. *J. Chromatogr. Sci.*, 32 (1994) 219-227.
- 343 Rotondo, D., Earl, C.R.A., Laing, K.J. and Kaimakamis, D.: Inhibition of cytokine-stimulated thymic lymphocyte proliferation by fatty acids: the role of eicosanoids. *Biochim. Biophys. Acta*, 1223 (1994) 185-194.
- 344 Thibault, A., Figg, W.D., McCall, N., Samid, D., Myers, C.E. and Cooper, M.R.: A simultaneous assay of the differentiating agents, phenylacetic acid and phenylbutyric acid, and one of their metabolites, phenylacetyl-glutamine, by reversed-phase, high performance liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2895-2900.
- 345 Vazques Oderiz, M., Vazques Blanco, M.E., Lopez Hernandez, J., Sihal Lozano, J. and Romero Rodriguez, M.A.: Simultaneous determination of organic acids and vitamin C in green beans by liquid chromatography. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 1056-1059.
- 346 Wang, R.Y. and Dienel, G.A.: Ion chromatography with suppressed conductivity detection: recoveries of ¹⁴C-labeled metabolites. *BioTechniques*, 17 (1994) 106-113; C.A., 121 (1994) 199912u.
- 347 Xu, Z., Li, X., Jiang, J., Yin, X., Shen, S. and Yang, J.: (Determination of the concentration of free fatty acids in the plasma of patients with malignant hematopoietic diseases by gas chromatography). *Sepu*, 12 (1994) 268-269; C.A., 121 (1994) 152467n.
- 348 Yasaka, Y. and Tanaka, M.: Labeling of free carboxyl groups. *J. Chromatogr. B*, 659 (1994) 139-155 - a review with 84 refs.
- For additional information see C.A.:
121 (1994) 33305y, 178018s.
- See also 17, 65, 157, 163, 207, 237, 366, 434, 1103, 1220.
- 11b. Prostaglandins*
- 349 Barbieri, B., Papadogiannakis, N., Eneroeth, P., Hansson, C., Roepstorff, P. and Olding, L.B.: Identification of a substance, previously shown to enhance mitogenesis of human lymphocytes, as the acetamide of p-aminobenzoic acid. *Biochim. Biophys. Acta*, 1214 (1994) 309-316.
- 350 Celardo, A., Dell'Elba, G., Eltantawy, Z.M., Evangelista, V. and Cerletti, C.: Simultaneous determination of leukotrienes B₄ and E₄ in whole blood and of leukotriene E₄ in urine of rabbit by reversed-phase high-performance liquid chromatography. *J. Chromatogr. B*, 658 (1994) 261-269.
- 351 Deigner, H.P., Wolf, G., Ohlenmacher, U. and Reichling, J.: 1'-Hydroxyeugenol- and coniferylalcohol derivatives as effective inhibitors of 5-lipoxygenase and Cu²⁺-mediated low density lipoprotein oxidation. Evidence for a dual mechanism. *Arzneim.-Forsch.*, 44 (1994) 956-961.
- 352 Do, U.H., Lo, S.-L., Iles, J., Rosenberger, T., Tam, P., Hong, Y. and Ahern, D.: Tritium isotope effect in high-performance liquid chromatography of eicosanoids. *Prostaglandins, Leukotrienes Essent. Fatty Acids*, 50 (1994) 335-338; C.A., 121 (1994) 74037f.
- See also 317, 325.

11c. *Lipids and their constituents*

- 353 Adosraku, R.K., Choi, G.T.Y., Constantinou-Kokotos, V., Anderson, M.M. and Gibson, W.A.: NMR lipid profiles of cells, tissues, and body fluids: proton analysis of human erythrocyte lipids. *J. Lipid Res.*, 35 (1994) 1025-1031.
- 354 Andersson, M., Ericsson, J., Appelqvist, E.-L., Schedin, S., Chojnacki, T. and Dallner, G.: Modulations in hepatic branch-point enzymes involved in isoprenoid biosynthesis upon dietary and drug treatments of rats. *Biochim. Biophys. Acta*, 1214 (1994) 79-87.
- 355 Beljaars, P.R., van Dijk, R. and Houwen-Claassen, A.A.M.: Determination of polymerized triglycerides in frying fats and oils by gel permeation chromatography: interlaboratory study. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 667-671.
- 356 Bock, K., Vinogradov, E.V., Holst, O. and Brade, H.: Isolation and structural analysis of oligosaccharide phosphates containing the complete carbohydrate chain of the lipopolysaccharide from *Vibrio cholerae* strain H11 (non-O1). *Eur. J. Biochem.*, 225 (1994) 1029-1039.
- 357 Caboni, M.F., Menotta, S. and Lercker, G.: High-performance liquid chromatography separation and light-scattering detection of phospholipids from cooked beef. *J. Chromatogr. A*, 683 (1994) 59-65.
- 358 Chang, L., Guo, Q., Yu, Z. and Xu, G.: (Chromatographic micro-analysis of gangliosides in serum). *Sepu*, 12 (1994) 189-191; C.A., 121 (1994) 152477r.
- 359 Christie, W.W.: Silver ion and chiral chromatography in the analysis of triacylglycerols. *Prog. Lipid Res.*, 33 (1994) 9-18; C.A., 121 (1994) 155956g.
- 360 Corradini, S.G., Cantafora, A., Capocaccia, L., Della Guardia, P., Giacomelli, L. and Angelico, M.: Development and validation of a quantitative assay for cholesterol crystal growth in human gallbladder bile. *Biochim. Biophys. Acta*, 1214 (1994) 63-72.
- 361 Dobarganes, M.C. and Marquez-Ruiz, G.: Size exclusion chromatography in the analysis of lipids. In: Christie, W.W. (Editor), *Adv. Lipid Methodol. - Two*, Oily Press, Dundee, 1993, pp. 113-137; C.A., 121 (1994) 128961y - a review with 134 refs.
- 362 Dove, S.K., Lloyd, C.W. and Drobak, B.K.: Identification of a phosphatidylinositol 3-hydroxy kinase in plant cells: association with the cytoskeleton. *Biochem. J.*, 303 (1994) 347-350.
- 363 Estevez, F., Pulford, D., Stark, M.J.R., Carter, A.N. and Downes, C.P.: Inositol trisphosphate metabolism in *Saccharomyces cerevisiae*: identification, purification and properties of inositol 1,4,5-trisphosphate 6-kinase. *Biochem. J.*, 302 (1994) 709-716.
- 364 Firestone, D.: Gel permeation liquid chromatographic method for determination of polymerized triglycerides in oils and fats: summary of collaborative study. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 957-960.
- 365 Firestone, D.: Liquid chromatographic method for the determination of triglycerides in vegetable oils in terms of their partition numbers: summary of collaborative study. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 954-957.
- 366 Folcik, V.A. and Cathcart, M.K.: Predominance of esterified hydroperoxy-linoleic acid in human monocyte-oxidized LDL. *J. Lipid Res.*, 35 (1994) 1570-1582.
- 367 Hernandez, A., Cooke, D.T. and Clarkson, D.T.: Lipid composition and proton transport in *Penicillium cyclopium* and *Ustilago maydis* plasma membrane vesicles isolated by two-phase partitioning. *Biochim. Biophys. Acta*, 1195 (1994) 103-109.
- 368 Hradec, J. and Dufek, P.: Determination of cholesteryl 14-methylhexadecanoate in blood serum by reversed-phase high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 386-389.
- 369 Jaaskelainen, I. and Urtti, A.: Liquid chromatography determination of liposome components using a light-scattering evaporative detector. *J. Pharm. Biomed. Anal.*, 12 (1994) 977-982.
- 370 Kazuya, I.-P., Hidari, J., Ichikawa, S., Furukawa, K., Yamasaki, M. and Hirabayashi, Y.: β 1-4N-Acetylgalactosaminyltransferase can synthesize both asialoglycosphingolipid GM₂ and glycosphingolipid GM₂ *in vitro* and *in vivo*: isolation and characterization of a β 1-4N-acetylgalactosaminyltransferase cDNA clone from rat ascites hepatoma cell line AH7974F. *Biochem. J.*, 303 (1994) 957-965.
- 371 Kodawaki, H., Grant, M.A. and Seyfried, T.N.: Effect of Golgi membrane phospholipid composition on the molecular species of GM3 gangliosides synthesized by rat liver sialyltransferase. *J. Lipid Res.*, 35 (1994) 1956-1964.
- 372 Liepkalns, V.A., Myher, J.J., Kuksis, A., Leli, U., Freysz, N. and Hauser, G.: Complementary chromatographic analysis of free diacylglycerols and potential glycerophospholipid precursors in human SH-SY5Y neuroblastoma cells following incubation with lithium chloride. *J. Chromatogr. B*, 658 (1994) 223-232.
- 373 Marquez-Ruiz, G., Perez-Camino, M.C., Rios, J.J. and Dobarganes, M.C.: Characterization of sucrose polyesters-triacylglycerols mixtures. *J. Am. Oil Chem. Soc.*, 71 (1994) 1017-1020.
- 374 Menzelev, R.F., Krasnopol'sky, Yu.M., Zvonkova, E.N. and Shvets, V.I.: Preparative separation of ganglioside GM₃ by high-performance liquid chromatography. *J. Chromatogr. A*, 678 (1994) 183-187.
- 375 Neff, W.E., Adlof, R.O. and El-Agaimy, M.: Silver ion high-performance liquid chromatography of the triacylglycerols of *Crepis alpina* seed oil. *J. Am. Oil Chem. Soc.*, 71 (1994) 853-855.
- 376 Noda, N., Tanaka, R., Tsujino, K., Takasaki, Y., Nakano, M., Nishi, M. and Miyahara, K.: Phosphocholine-bonded galactosylceramides having a tri-unsaturated long-chain base from the clam worm, *Marpissa sanguinea*. *J. Biochem. (Tokyo)*, 116 (1994) 435-442.
- 377 Safari, M. and Kermasha, S.: Interesterification of butterfat by commercial microbial lipases in a cosurfactant - free microemulsion system. *J. Am. Oil Chem. Soc.*, 71 (1994) 969-973.
- 378 Simoneau, C., Fairley, P., Krochta, J.M. and German, J.B.: Thermal behavior of butterfat fractions and mixtures of tripalmitin and butterfat. *J. Am. Oil Chem. Soc.*, 71 (1994) 795-801.
- 379 Suortti, T., Forssell, P., Aura, A.-M., Mustanta, A. and Poutanen, K.: Reevaluation of refractive index detector for the lipid and phospholipid analysis. In: Maikki, Y. and Lambertsen, G. (Editors), *Nord. Lipid Symp., Proc. 17th*, 1993, Scand. Forum Lipid Res. Technol., Bergen, 1993, pp. 217-221; C.A., 121 (1994) 156052w.

- 380 Valeur, A., Olsson, N.U., Kaufmann, P., Wada, S., Kroon, C.G., Westerdahl, G. and Odham, G.: Quantification and comparison of some natural sphingomyelins by online high-performance liquid chromatography/discharge-assisted thermospray mass spectrometry. *Biol. Mass Spectrom.*, 23 (1994) 313-319; C.A., 121 (1994) 30468t.
- 381 Weete, J.D., Betageri, S. and Griffith, G.L.: Improvement of lecithin as an emulsifier for water-in-oil emulsions by thermalization. *J. Am. Oil Chem. Soc.*, 71 (1994) 731-737.
- 382 Yamaguchi, Y., Sasagasko, N., Goto, I. and Kobayashi, T.: The synthetic pathway for glucosylsphingosine in cultured fibroblasts. *J. Biochem. (Tokyo)*, 116 (1994) 704-710.
- 383 Yohe, H.C.: Removal of borate from tritiated gangliosides via the mannitolborate complex. *J. Lipid Res.*, 35 (1994) 2100-2102.
- 384 Ziegleder, G., Geier-Greguska, J. and Grapin, J.: HPLC - Analyse von Fettreif. *Fat Sci. Technol.*, 96 (1994) 390-394.

For additional information see C.A.:

121 (1994) 129386b.

See also 69, 389, 469, 915.

11d. Lipoproteins and their constituents

- 385 Evans, G.F., Bensch, W.R., Apelgren, L.D., Bailey, D., Kauffman, R.F., Burnol, T.F. and Zuckerman, S.H.: Inhibition of cholesteryl ester transfer protein in normocholesterolemic hamsters: effects on HDL subspecies, quantity, and apolipoprotein distribution. *J. Lipid Res.*, 35 (1994) 1634-1645.
- 386 Ikewaki, K., Rader, D.J., Zech, A. and Brewer, K.B., Jr.: *In vivo* metabolism of apolipoproteins A-I and E in patients with abetalipoproteinemia: implications for the roles of apolipoproteins B and E in HDL metabolism. *J. Lipid Res.*, 35 (1994) 1809-1819.
- 387 Ishigami, M., Yamashita, S., Sakai, N., Arai, T., Hirano, K.-i., Hiraoka, H., Kameda-Takemura, K. and Matsuzawa, Y.: Large and cholesteryl ester-rich high-density lipoproteins in cholesteryl ester transfer protein (CETP) deficiency can not protect macrophages from cholesterol accumulation induced by acetylated low-density lipoproteins. *J. Biochem. (Tokyo)*, 116 (1994) 257-262.
- 388 Lopez, J., Latta, M., Collet, X., Vanloo, B., Jung, G., Denefle, P., Rosseneu, M. and Chambaz, J.: Purification and characterization of recombinant human apolipoprotein A-II expressed in *Escherichia coli*. *Eur. J. Biochem.*, 225 (1994) 1141-1150.
- 389 Ragolia, L. and Tropp, B.E.: The effects of phosphoglycerides on *Escherichia coli* cardiolipin synthase. *Biochim. Biophys. Acta*, 1214 (1994) 323-332.
- 390 Tallis, G.A., Shephard, M.D.S. and Whiting, M.J.: Lipoprotein profiling by high performance gel chromatography. *Clin. Chim. Acta*, 228 (1994) 171-179.

See also 520.

12. ORGANIC PEROXIDES

- 391 Pinkernell, U., Karst, U. and Cammann, K.: Determination of peroxyacetic acid using high-performance liquid chromatography with external calibration. *Anal. Chem.*, 66 (1994) 2599-2602.

See also 1158.

13. STEROIDS

13a. General techniques

- 392 Sadlej-Sosnowska, N.: Structure retention relationship for steroid hormones. Functional groups as structural descriptors. *J. Liq. Chromatogr.*, 17 (1994) 2319-2330.

For additional information see C.A.:

121 (1994) 196102u, 196103v.

See also 65, 157.

13b. Pregnane and androstane derivatives

- 393 Courteyn, D., Verheyen, N., Bakeroot, V., Dal, V., Schilt, R., Hooijerink, H., van Bennekom, E.O., Haasnoot, W., Stouten, P., et al.: Detection of corticosteroids in animal feed and premixes: a new category of growth promoters. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 1, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 251-256; C.A., 121 (1994) 177964k.
- 394 Euerby, M.R., Johnson, C.M., Lewis, R.J. and Nichols, S.C.: The S-oxidative degradation of a novel corticosteroid tipredane (INN). Part II - detailed investigations into the primary S-oxidation of tipredane using achiral oxidants. *J. Pharm. Biomed. Anal.*, 12 (1994) 761-769.
- 395 Hendriks, L., Courteyn, D., Gielen, B., Leyssens, L. and Raus, J.: A multiresidue method for the detection of anabolic steroids in fecal samples of living animals: screening and confirmation of "real samples". In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 2, Utrecht, Univ. Fac. Vet. Med., Utrecht, 1993, pp. 367-371; C.A., 121 (1994) 177969r.
- 396 Krynetsky, E.Yu., Kovaleva, I.E. and Luzikov, V.N.: (Heterological expression of functionally active human cytochromes P450. Cytochrome P450IIIA4 catalyzes the biotransformation of the anabolic steroid hormone methandrostenolone). *Biokhimiya (Moscow)*, 59 (1994) 282-287.
- 397 Lykkesfeldt, J., Loft, S. and Poulsen, H.E.: Simultaneous determination of urinary free cortisol and 6 β -hydroxycortisol by high-performance liquid chromatography to measure human CYP3A activity. *J. Chromatogr. B*, 660 (1994) 23-29.

- 398 Olah, T.V., Gilbert, J.D., Barrish, A., Greber, T.F. and McLoughlin, D.A.: A rapid and specific assay, based on liquid chromatography-atmospheric pressure chemical ionization mass spectrometry, for the determination of MK-434 (a 5 α -reductase inhibitor) and its metabolites in plasma. *J. Pharm. Biomed. Anal.*, 12 (1994) 705-712.
- 399 Stanley, S.M.R., Wilhelmi, B.S., Rodger, J.P. and Guthrie, A.: Detection of corticosteroids by high-performance liquid chromatography/negative ion chemical ionization mass spectrometry using a particle beam interface. *Biol. Mass Spectrom.*, 23 (1994) 483-491; C.A., 121 (1994) 127236d.

For additional information see C.A.:

121 (1994) 74064n.

13c. Estrogens

- 400 Novakovic, J., Tvrzicka, E. and Pacakova, V.: High-performance liquid chromatographic determination of equine estrogens with ultraviolet absorbance and electrochemical detection. *J. Chromatogr. A*, 678 (1994) 359-363.
- 401 Tacey, R.L., Harman, W.J. and Kelly, L.L.: Development of a highly sensitive and specific assay for plasma ethinylestradiol using combined extraction, liquid chromatography and radioimmunoassay. *J. Pharm. Biomed. Anal.*, 12 (1994) 1303-1310.

For additional information see C.A.:

121 (1994) 141419x, 196112x.

13d. Sterols

- 402 Casiraghi, E., Lucisano, M., Pompei, C. and Dellea, C.: Cholesterol determination in butter by high performance chromatography. *Milchwissenschaft*, 49 (1994) 194-196; C.A., 121 (1994) 103616v.
- 403 Grob, K., Giuffre, A.M., Leuzzi, U. and Mincione, B.: Recognition of adulterated oils by direct analysis of the minor components. *Fat Sci. Technol.*, 96 (1994) 286-290.
- 404 Grob, K., Giuffre, A.M., Biedermann, M. and Bronz, M.: The detection of adulteration with desterolized oils. *Fat Sci. Technol.*, 96 (1994) 341-345.
- 405 Plank, C. and Lorbeer, E.: On-line liquid chromatography-gas chromatography for the analysis of free and esterified sterols in vegetable oil methyl esters used as diesel fuel substitutes. *J. Chromatogr. A*, 683 (1994) 95-104.
- 406 Salen, G., Batta, A.K., Tint, G.S., Shefer, S. and Ness, G.C.: Inverse relationship between plasma cholestanol concentrations and bile acid synthesis in sitosterolemia. *J. Lipid Res.*, 35 (1994) 1878-1887.

For additional information see C.A.:

121 (1994) 199914w.

See also 334, 353, 368.

13e. Bile acids and alcohols

- 407 Crawford, J.M., Strahs, D.C.J., Crawford, A.R. and Barnes, S.: Role of bile salt hydrophobicity in hepatic microtubule-dependent bile salt secretion. *J. Lipid Res.*, 35 (1994) 1738-1748.

- 408 Hagey, L.R., Schteingart, C.D., Ton-Nu, H.-T. and Hofmann, A.F.: Biliary bile acids of fruit pigeons and doves (*Columbiformes*): presence of 1 β -hydroxy-chenodeoxycholic acid and conjugation with glycine as well as taurine. *J. Lipid Res.*, 35 (1994) 2041-2048.
- 409 Levy, J., Budai, K. and Jawitt, N.B.: Bile acid synthesis in HepG2 cells: effect of cyclosporin. *J. Lipid Res.*, 35 (1994) 1795-1800.
- 410 Marschall, H.-U., Griffiths, W.J., Zhang, J., Wietholtz, H., Matern, H., Matern, S. and Sjövall, J.: Positions of conjugation of bile acids with glucose and N-acetylglucosamine *in vitro*. *J. Lipid Res.*, 35 (1994) 1599-1610.
- 411 Ohshima, A., Kuramoto, T. and Hoshita, T.: Biochemical studies of inherited diseases related to abnormal cholesterol metabolism. I. High-performance liquid chromatographic analysis of bile alcohol glucuronides in cerebrotendinous xanthomatosis. *Biol. Pharm. Bull.*, 17 (1994) 721-723; C.A., 121 (1994) 129044p.
- 412 Wahlen, E., Tamasawa, N., Ichimiya, H., Egestad, B. and Sjövall, J.: Conditions for solid-phase extraction of urinary bile acids with octadecylsilane-bonded silica. *J. Lipid Res.*, 35 (1994) 1902-1906.
- 413 Yoshii, M., Une, M., Kihira, K., Kuramoto, T., Akizawa, T., Yoshioka, M., Butler, V.P., Jr. and Hoshita, T.: Bile salts of the toad, *Bufo marinus*: characterization of a new unsaturated higher bile acid, 3 α ,7 α ,12 α ,26-tetrahydroxy-5 β -cholest-23-en-27-oic acid. *J. Lipid Res.*, 35 (1994) 1646-1651.

See also 406.

13g. Other steroids

- For additional information see C.A.:
- 121 (1994) 141829f.

14. STEROID GLYCOSIDES AND SAPONINS

- 414 Pekic, B. and Slavica, B.: High-performance liquid chromatographic determination of digoxin, α - and β -methyldigoxin. Zb. Matice Srpsk. Prir. Nauke, 84 (1993) 73-78; C.A., 121 (1994) 117846p.

See also 217.

15. TERPENES AND OTHER VOLATILE AROMATIC COMPOUNDS

15a. Terpenes

- 415 Ando, M., Kikuchi, K., Isogai, K., Ishiwatari, T., Hirata, N. and Yamazaki, H.: Synthetic studies of sesquiterpene with a *cis*-fused decalin system. 5. A synthetic approach to the study of structure-activity relationships of the termitcidal norsesquiterpenoids, chamaecynone and related compounds. *J. Natural Prod.*, 57 (1994) 924-933.
- 416 Denyer, C.V., Jackson, P., Loakes, D.M., Ellis, M.R. and Young, D.A.B.: Isolation of antirhinoviral sesquiterpene from ginger (*Zingiber officinale*). *J. Natural Prod.*, 57 (1994) 658-664.

- 417 LeFever, R.E., Vogel, B.S. and Croteau, R.: Diterpenoid resin acid biosynthesis in conifers: enzymatic cyclization of geranylgeranyl pyrophosphate to abietadiene, the precursor of abietic acid. *Arch. Biochem. Biophys.*, 313 (1994) 139-149.
- 418 Mattina, M.J.I. and MacEachern, G.J.: Extraction, purification by solid-phase extraction and high-performance liquid chromatographic analysis of taxanes from ornamental *Taxus* needles. *J. Chromatogr. A*, 679 (1994) 269-275.
- 419 Okamura, N., Fujimoto, Y., Kuwabara, S. and Yagi, A.: High-performance liquid chromatographic determination of carnosic acid and carnosol in *Rosmarinus officinalis* and *Salvia officinalis*. *J. Chromatogr. A*, 679 (1994) 381-386.

15b. Essential oils

- 420 Lux, I. and Popescu, H.: (Application of chromatography reagents to the identification of volatile oils). *Farmacia (Bucharest)*, 41 (1993) 15-23; C.A., 121 (1994) 65264a.

15c. Bitter substances

- 421 Buckee, G.K.: Determination of iso-alpha- and beta-acids in hop and isomerized hop extracts: a collaborative trial. *Tech. Q.-Master Brew. Assoc. Am.*, 30 (1993) 180-183; C.A., 121 (1994) 156036u.
- 422 Buckee, G.K.: Determination of iso-alpha-, alpha- and beta-acids in hop and isomerized hop extracts: a collaborative trial. *J. Inst. Brew.*, 100 (1994) 151-153; C.A., 121 (1994) 177998z.

16. NITRO AND NITROSO COMPOUNDS

- 423 Feltes, J. and Koll, J.: GC and HPLC with selective detection for the determination of explosives in water and soil. *LC-GC Int.*, 7, No. 12 (1994) 698-701.
- 424 Hochberg, E., Liang, Y.L. and Chen, T.H.: Rapid method for the analysis of PAX-2A. *Int. Annu Conf. ICT*, 24th (1994) 12-1/12-10; C.A., 121 (1994) 38720q.
- 425 Voznakova, Z. and Tesarova, E.: (Determination of nitrophenols and alkylphenols by GC and HPLC). *Chem. Listy*, 88 (1994) 393-400; C.A., 121 (1994) 72787b.

See also 449, 1087.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

17a. Amines and polyamines

- 426 Bovingdon, M.E. and Webster, R.A.: Derivatization reactions for neurotransmitters and their automation. *J. Chromatogr. B*, 659 (1994) 157-183 - a review with 106 refs.
- 427 Huebert, N.D., Schwach, V., Richter, G., Zreika, M., Hinze, C. and Haegle, K.D.: The measurement of β -phenylethylamine in human plasma and rat brain. *Anal. Biochem.*, 221 (1994) 42-47.

- 428 Kalligas, G., Kaniou, I., Zachariadis, G., Tsoukali, H. and Epivatianos, P.: Thin layer and high pressure liquid chromatographic determination of histamine in fish tissues. *J. Liq. Chromatogr.*, 17 (1994) 2457-2468.
- 429 Maisch, A., Maier-Rosenkranz, J., Kupka, A. and Foeldi, P.: (Pre-column derivatization of biochemical relevant amines). *Labor-Praxis*, 18 (1994) 48-56; C.A., 121 (1994) 49354z - a review with 16 refs.
- 430 Mao, J., Dennis, M.W., Foster, R. and Fackler, P.H.: Analysis of diethylenetriamine in water and soil at ppb levels by high performance liquid chromatography with fluorescence detection. *J. Liq. Chromatogr.*, 17 (1994) 2485-2494.
- 431 Maurer, W., Nuennrich, P., Hohaus, E., York, H., Schleser, B. and Breuer, D.: (Development and application of a method for the quantitative determination of mono-, di- and triethanolamine in cooling lubricants with respect to the German technical regulation TRGS611). *Staub-Reinhalt. Luft*, 54 (1994) 239-245; C.A., 121 (1994) 137247x.
- 432 Mei, Y.-H.: A sensitive and fast method for the determination of polyamines in biological samples. Benzoyl chloride pre-column derivatization high-performance liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2413-2418.
- 433 Nakazato, M., Saito, K., Morozumi, S., Wauke, T., Ishikawa, F., Fujinuma, K., Moriyasu, T., Nishima, T. and Tamura, Y.: (Determination of putrefactive non-volatile amines in foods following sample cleanup by solid phase extraction). *Jpn. J. Toxicol. Environ. Health*, 40 (1994) 203-209; C.A., 121 (1994) 81212n.
- 434 Oi, N., Kitahara, H. and Aoki, F.: (Enantiomer separation of amines and carboxylic acids by HPLC with chiral copper(II) complexes as stationary phases). *Kuromatogurafi*, 14 (1993) 88-89; C.A., 121 (1994) 194583c.
- 435 Tao, Y., Skrenta, H.M. and Chen, K.Y.: Deoxyhypusine synthase assay based on the use of polyhistidine-tagged substrate and metal chelate-affinity chromatography. *Anal. Biochem.*, 221 (1994) 103-108.
- 436 Walbroehl, Y. and Wagner, J.: Enantiomeric resolution of primary amines by capillary electrophoresis and high-performance liquid chromatography using chiral crown ethers. *J. Chromatogr. A*, 680 (1994) 253-261.
- 437 Yamazaki, S., Saito, K. and Tanimura, T.: Enantiomeric separation of underivatized aliphatic and aromatic β -aminoalcohols by reversed-phase liquid chromatography with a chiral mobile phase. *J. Liq. Chromatogr.*, 17 (1994) 2559-2567.

See also 17, 65, 104, 167, 338, 439, 478.

17b. Catecholamines and their metabolites

- 438 Carter, A.J.: Microbore high-performance liquid chromatographic method for the measurement of dopamine and its metabolites: recommendations for optimal sample collection and storage. *J. Chromatogr. B*, 660 (1994) 158-163.
- 439 Grosclaude, J.M., Nembo, B., Barreteau, H., Elkihel, L., Trouvin, J.-H., Jacquot, C., Gayral, P. and Goudey-Perrière, F.: Influence of sample recovery techniques on detection of biogenic amines in the rat hookworm *Nippostrongylus brasiliensis*. *J. Liq. Chromatogr.*, 17 (1994) 2705-2721.

- 440 Gumbhir, K. and Mason, W.D.: Determination of *m*-hydroxy-mandelic acid, *m*-hydroxyphenylglycol and their conjugates in human plasma using liquid chromatography with electrochemical detection. *J. Pharm. Biomed. Anal.*, 12 (1994) 943-949.
- 441 Justice, J.B., Jr., Newton, A.P. and Smith, A.D.: *In vivo* monitoring of neurotransmitters with voltammetry and smallbore HPLC. *J. Chin. Chem. Soc. (Taipei)*, 41 (1994) 287-292; C.A., 121 (1994) 27067f.
- 442 Mashige, F., Takai, N., Matsushima, Y., Ito, A., Takano, M., Tsuchiya, E., Kanazawa, H., Nagata, Y., Shinozuka, N., et al.: (Simultaneous determination of catecholamines, serotonin, and their precursors and metabolites in body fluid by an HPLC system with multi-electrode electrochemical detector). *Rinsho Byori*, 42 (1994) 591-599; C.A., 121 (1994) 73955s - a review with 9 refs.
- 443 Radjaipour, M., Raster, H. and Liebich, H.M.: Quantitation of urinary catecholamines, their abundant metabolites, and 5-hydroxyindoleacetic acid by high performance liquid chromatography and electrochemical detection, using a single mobile phase and uniform isocratic conditions. *Eur. J. Clin. Chem. Clin. Biochem.*, 32 (1994) 609-613.
- 444 Sallstrom Baum, S. and Rommelspacher, H.: Determination of total dopamine, R- and S-salsolinol in human plasma by cyclodextrin bonded-phase liquid chromatography with electrochemical detection. *J. Chromatogr. B*, 660 (1994) 235-241.
- 445 Simon-Sarkadi, L. and Holzapfel, W.H.: Determination of biogenic amines in leafy vegetables with an amino acid analyzer. *Z. Lebensm.-Unters. Forsch.*, 198 (1994) 230-233; C.A., 121 (1994) 177959n.
- 446 Watanabe, Y., Shimada, N., Kiso, K., Kakihana, K. and Shibuya, T.: (Real-time observation of changes in monoamine levels in cultured cerebellar granule cells under hypoxia using a newly developed microdialysis method). *Neurosciences (Okayama)*, 20(Suppl.) (1994) P5-P8; C.A., 121 (1994) 199937f.

For additional information see C.A.:
121 (1994) 77542c, 170704s.

See also 73.

17c. Urea and guanidine derivatives

- 447 Walker, T.A.: A liquid chromatographic assay for urea in over-the-counter carbamide peroxide products. *J. Pharma. Biomed. Anal.*, 12 (1994) 1277-1282.

17d. Other amine derivatives and amides (excl. peptides)

- 448 Huynh, C.K., Vu-Duc, T. and Guillemin, M.: (Analysis of volatile and tobacco-specific altrosamines in the smoke of some cigarette brands sold in the Swiss market). *Mitt. Geb. Lebensmittelunters. Hyg.*, 84 (1993) 281-290; C.A., 121 (1994) 172340u.
- 449 Zhou, Z.Y., Dauphin, C., Prognon, P. and Hamon, M.: Luminarin 9: a new fluorescent reagent for the precolumn derivatization of main volatile and non-volatile N-nitrosamines in RP-HPLC. *Chromatographia*, 39 (1994) 185-191.

For additional information see C.A.:
121 (1994) 141902z.

See also 1063, 1178.

18. AMINO ACIDS AND PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS
- 18a. *Amino acids and their derivatives*
- 450 Aminuddin, M. and Miller, J.N.: A fast liquid chromatographic method for the determination of amino acids. *J. Chem. Soc. Pak.*, 16 (1994) 17-20; C.A., 121 (1994) 152474n.
- 451 Arnold, U., Ludwig, E., Kuehn, R. and Moeschwitzer, U.: Analysis of free amino acids in green coffee beans. Part 1. Determination of amino acids after precolumn derivatization using 9-fluorenylmethylchloroformate. *Z. Lebensm.-Unters. Forsch.*, 199 (1994) 22-25; C.A., 121 (1994) 132515y.
- 452 Brückner, H. and Westhauser, T.: Chromatographic determination of D-amino acids as native constituents of vegetables and fruits. *Chromatographia*, 39 (1994) 419-426.
- 453 Bruckner, H., Haasmann, S. and Friedrich, A.: Quantification of D-amino acids in human urine using GC-MS and HPLC. *Amino Acids*, 6 (1994) 205-211; C.A., 121 (1994) 152698p.
- 454 Chen, B. and Guo, M.: (High performance liquid chromatographic Pico-Tag analysis of amino acids in pteridophyte). *Sepu*, 12 (1994) 293-294; C.A., 121 (1994) 156061y.
- 455 Dall'Olio, G., Gheller, A., Negri, M., Magrone, V.F., Mezzina, G., Spellanzoni, M. and Soffiati, G.: Measurement of urinary hydroxyproline using high-pressure liquid chromatography: reference range for Nordin's test. *Eur. J. Lab. Med.*, 1 (1993) 147-150; C.A., 121 (1994) 152443b.
- 456 Effenhauser, C.S. and Manz, A.: Miniaturizing a whole analytical laboratory down to chip size. *Int. Lab.*, 24, No. 9 (1994) 10-12.
- 457 Forgacs, E.: Study of the binding of sodium dodecylsulfate to dibasic amino acids by reversed-phase chromatography. *Fresenius J. Anal. Chem.*, 349 (1994) 743-745.
- 458 Fu, S., Fan, C., Zhang, S., Wei, F. and Zhao, T.: (Chiral precolumn derivatization high performance liquid chromatographic resolution of aspartic acid in dentin). *Sepu*, 12 (1994) 287-288; C.A., 121 (1994) 152468p.
- 459 Janak, J., Billiet, H.A.H., Frank, J., Luyben, K.C.A.M. and Husek, P.: Separation of selenium analogues of sulphur-containing amino acids by high-performance liquid chromatography and high-resolution gas chromatography. *J. Chromatogr. A*, 677 (1994) 192-196.
- 460 Jianying, Z., Machida, Y., Sugahara, K. and Kodama, H.: Determination of D,L-propargylglycine and N-acetylpropargylglycine in urine and several tissues of D,L-propargylglycine-treated rats using liquid chromatography-mass spectrometry. *J. Chromatogr. B*, 660 (1994) 375-379.
- 461 Korakas, D., Valkó, K., Sakarellos, C., Sakarellos-Daisiotis, M. and Gibbons, W.A.: Analytical and semi-preparative separation of diastereomeric lipidic amino acid conjugates. *J. Pharm. Biomed. Anal.*, 12 (1994) 1141-1145.
- 462 Lange, M. and Mályusz, M.: Improved determination of small amounts of free hydroxyproline in biological fluids. *Clin. Chem. (Washington)*, 40 (1994) 1735-1738.
- 463 Ma, Y. and Ito, Y.: Separations of basic amino acid benzyl esters by pH-zone-refining counter-current chromatography. *J. Chromatogr. A*, 678 (1994) 233-240.

- 464 McBroom, T., Stubbs, H.J., Wadhwa, M.S., Thomas, V.H. and Rice, K.G.: Reversal of tyrosinamide-oligosaccharide derivatization by Edman degradation. *Anal. Biochem.*, 222 (1994) 243-250.
- 465 Okuma, E. and Abe, H.: Simultaneous determination of D- and L-amino acids in the nervous tissues of crustaceans using pre-column derivatization with (+)-1-(9-fluorenyl)ethyl chloroformate and reversed-phase ion-pair high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 243-250.
- 466 Pernigo, N., Faccioli, D. and Ravizza, L.: (HPLC analysis of perfusion solutions of L-amino acids by using precolumn derivatization with 9-fluorenylmethylchloroformate). *Riv. Tossicol.: Sper. Clin.*, 23 (1993) 49-61; *C.A.*, 121 (1994) 117875x.
- 467 Ramseier, U. and Chang, J.-Y.: Modification of cysteine residues with N-methyl iodoacetamide. *Anal. Biochem.*, 221 (1994) 231-233.
- 468 Saito, K., Itaya, T., Horie, M., Nakazawa, H. and Imanari, T.: Estimation of arginine metabolism in putrefactive bacteria using liquid chromatography. *Jpn. J. Toxicol. Environ. Health*, 40 (1994) 140-146; *C.A.*, 121 (1994) 30141f.
- 469 Seenaiah, B. and Ellingson, J.S.: High-performance liquid chromatographic method for determination of the metabolism of polyunsaturated molecular species of phosphatidylserine labeled in the polar group. *J. Chromatogr. B*, 660 (1994) 380-385.
- 470 Strydom, D.J. and Cohen, S.A.: Comparison of amino acid analyses by phenylisothiocyanate and 6-aminoquinolyl-N-hydroxysuccinimidyl carbamate precolumn derivatization. *Anal. Biochem.*, 222 (1994) 19-28.
- 471 Szókán, G., Hadfi, S., Krizsán, K., Liembeck, A., Krecz, I., Almás, M. and Somlai, C.: HPLC determination of enantiomeric purity of protected amino acid derivatives used in peptide synthesis. *J. Liq. Chromatogr.*, 17 (1994) 2759-2775.
- 472 Teerlink, T.: Derivatization of posttranslationally modified amino acids. *J. Chromatogr. B*, 659 (1994) 185-207 - a review with 183 refs.
- 473 Van Eijk, H.M.H., Huinck, M.P.L., Rooyakkers, D.R. and Deutz, N.E.P.: Automated simultaneous isolation and quantitation of labeled amino acid fractions from plasma and tissue by ion-exchange chromatography. *J. Chromatogr. B*, 660 (1994) 251-257.
- 474 Wang, Q., Yan, B., Wang, S. and Tao, X.: (Computer-assisted optimization of separation of amino acids in column chromatography). *Gaodex Xuexiao Huaxue Xuebao*, 15 (1994) 72-74; *C.A.*, 121 (1994) 72750j.
- 475 Whiting, M.J., Rutten, A.J., Williams, P. and Bersten, A.D.: Determination of NG-nitro-L-arginine and NG-nitro-L-arginine methyl ester in plasma by high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 170-175.
- 476 Yang, Y., Qin, Q. and Guo, W.: Separation and quantitative analysis of amino acids derivatized with phenyl isocyanate by high performance liquid chromatography. *Sepu*, 12 (1994) 295-296; *C.A.*, 121 (1994) 194596j.
- 477 Yoshihara, K., Mochidome, N., Hara, T., Osada, S., Takayama, A. and Nagata, M.: Urinary excretion levels of hydroxylysine glycosides in osteoporotic patients. *Biol. Pharm. Bull.*, 17 (1994) 836-839; *C.A.*, 121 (1994) 199957n.
- 478 Yu, J.H., Li, G.D., Krull, I.S. and Cohen, S.: Polymeric 6-aminoquinoline, an activated carbamate reagent for derivatization of amines and amino acids by high-performance liquid chromatography. *J. Chromatogr. B*, 658 (1994) 249-260.
- See also 65, 89, 125, 167, 169, 246, 330, 344, 426, 552, 651, 872, 985.
- 18b. Peptides, peptidic and proteinous hormones, growth factors
- 479 Akiyama, T.H., Sasagawa, T., Suzuki, M. and Titani, K.: A method for selective isolation of the amino-terminal peptide from α -amino-blocked proteins. *Anal. Biochem.*, 222 (1994) 210-216.
- 480 Bordlin, G., Cordeiro Raposo, F. and Rodriguez, A.R.: Chromatographic characterization of a hexapeptide containing three thiol groups, intrinsic to the metallothionein structure. *Chromatographia*, 39 (1994) 146-154.
- 481 Calvaruso, G., Tesoriere, G., Vento, R., Giuliano, M. and Carabillo, M.: High-performance liquid chromatographic method for the determination of insulin synthesis in biological systems. *J. Chromatogr. B*, 660 (1994) 259-264.
- 482 Chang, J.P.: Non-denaturing potency assay for bovine somatotropin. *PCT Int., Appl. WO 94 17,403 (Cl. GO1N30/02)*, 04 Aug. 1994, US Appl. 9,034, 26 Jan. 1993; 38 pp.; *C.A.*, 121 (1994) 174653x.
- 483 Dass, C., Mahalakshmi, P. and Grandberry, D.: Manipulation of ion-pairing reagents for reversed-phase high-performance liquid chromatographic separation of phosphorylated opioid peptides from their non-phosphorylated analogues. *J. Chromatogr. A*, 678 (1994) 249-257.
- 484 Demin, A.A., Malinin, V.V., Shataeva, L.K. and Chernova, I.A.: Chromatographic methods for isolation of the immunostimulative peptides of milk whey. *Prikl. Biokhim. Mikrobiol.*, 30 (1994) 311-315; *C.A.*, 121 (1994) 55381x.
- 485 Duve, H., Johnsen, A.H., Scott, A.G., East, P. and Thorpe, A.: [Hyp^3]Met-Callatosatin. Identification and biological properties of a novel neuropeptide from the blowfly *Calliphora vomitoria*. *J. Biol. Chem.*, 269 (1994) 21059-21066.
- 486 Electricwala, A.: Isolation of prolactin from human pituitary glands: some safety aspects of an improved partial purification procedure. *Bioseparation*, 4 (1994) 263-269; *C.A.*, 121 (1994) 170707v.
- 487 Ertel, E.A., Warren, V.A., Adams, M.E., Griffin, P.R., Cohen, C.J. and Smith, M.M.: Type III ω -agatoxins: a family of probes for similar binding sites on L- and N-type calcium channels. *Biochemistry*, 33 (1994) 5098-5108.
- 488 Fainzilber, M., Hasson, A., Oren, R., Burlingame, A.L., Gordon, D., Spira, M.E. and Zlotkin, E.: New mollusc-specific α -conotoxins block *Aplysia* neuronal acetylcholine receptors. *Biochemistry*, 33 (1994) 9523-9529.
- 489 Fridland, G.H. and Desiderio, D.M.: Detection of bovine pituitary opioid precursors during gel permeation using trypsin and cyanogen bromide treatment followed by radioimmunoassay. *Anal. Lett.*, 27 (1994) 2117-2125.
- 490 Garcia, M.L., Garcia-Calvo, M., Hidalgo, P., Lee, A. and MacKinnon, R.: Purification and characterization of three inhibitors of voltage-dependent K^+ channels from *Leiurus quinquestriatus* var. *hebraeus* venom. *Biochemistry*, 33 (1994) 6834-6839.

- 491 Gregoriou, M., Willis, A.C., Pearson, M.A. and Crawford, C.: The calpain cleavage sites in the epidermal growth factor receptor kinase domain. *Eur. J. Biochem.*, 223 (1994) 455-464.
- 492 Hober, S., Hansson, A., Uhlen, M. and Nilsson, B.: Folding of insulin-like growth factor I is thermodynamically controlled by insulin-like growth factor binding protein. *Biochemistry*, 33 (1994) 6758-6761.
- 493 Honjo, T. and Shibata, H.: Purification of human transforming growth factor- β (TGF- β). *Jpn. Kokai Tokkyo Koho* JP 06,145,197 [94,145,197] (Cl. C07K15/06), 24 May 1994, Appl. 92/322,471, 06 Nov. 1992; 5 pp; C.A., 121 (1994) 100702r.
- 494 Ishibashi, J., Kataoka, H., Isogai, A., Kawakami, A., Saegusa, H., Yagi, Y., Mizoguchi, A., Ishizaki, H. and Suzuki, A.: Assignment of disulfide bond location in prothoracotropin hormone of the silkworm, *Bombyx mori*: a homodimeric peptide. *Biochemistry*, 33 (1994) 5912-5919.
- 495 Johnsen, A.H.: Identification of cholecystokinin from frog and turtle. Divergence of cholecystokinin and gastrin occurred before the evolution of amphibia. *Eur. J. Biochem.*, 224 (1994) 691-702.
- 496 Kung, W., David, F., Langen, H., Weyer, K.A., Schlaeger, E.-J., Lahm, H.-W., Silber, E., Mueller, H. and Eppenberger, U.: Isolation of a heregulin-like growth factor secreted by estrogen receptor-negative MDA-MB-231 human breast cancer cells that stimulated estrogen receptor-positive cells. *Biochem. Biophys. Res. Commun.*, 202 (1994) 1357-1365.
- 497 Laidler, P., Cowan, D.A., Hider, R.C. and Kicman, A.T.: New decision limits and quality-control material for detecting human chorionic gonadotropin misuse in sports. *Clin. Chem. (Washington)*, 40 (1994) 1306-1311.
- 498 Lenz, V.J., Gattner, H.-G., Leithäuser, M., Brandenburg, D., Wollmer, A. and Höcker, H.: Proteolyses of a fluorogenic insulin derivative and native insulin in reversed micelles monitored by fluorescence emission reversed-phase high-performance liquid chromatography and capillary zone electrophoresis. *Anal. Biochem.*, 221 (1994) 85-93.
- 499 Liu, Q. and Lin, Q.: (Determination of two small peptides in serum and nutrition solution by high-performance liquid chromatography). *Zhonghua Yixue Jianyan Zazhi*, 17 (1994) 84-86; C.A., 121 (1994) 199922x.
- 500 Marastoni, M., Salvadori, S., Scaranari, V., Spisani, S., Reali, E., Traniello, S. and Tomatis, A.: Synthesis and activity of new linear and cyclic peptide T derivatives. *Arzneim.-Forsch.*, 44 (1994) 1073-1076.
- 501 Mor, A., Amiche, M. and Nicolas, P.: Structure, synthesis, and activity of dermaseptin B, a novel vertebrate defensive peptide from frog skin: relationship with adenoregulin. *Biochemistry*, 33 (1994) 6642-6650.
- 502 Nohihara, K., Kiffe, M., Yokomizo, Y., Nakamura, S. and Nishine, T.: Large-scale continuous-flow peptide synthesis with solvent and acyl component recovery. *Int. Lab.*, 24, No. 9 (1994) 15-18.
- 503 Odum, L. and Johnsen, A.H.: Human seminal plasma contains somatostatin. *Biochem. J.*, 303 (1994) 263-268.
- 504 Paloheimo, L.I. and Rehfeld, J.F.: A processing-independent assay for human procholecystokinin and its products. *Clin. Chim. Acta*, 229 (1994) 49-65.
- 505 Pyo, D. and Lee, M.: Chemical analysis of microcystins RR and LR in cyanobacterium using a prepacked cyano cartridge. *Chromatographia*, 39 (1994) 427-430.
- 506 Rehfeld, J.F. and Johnsen, A.J.: Identification of gastrin component I as gastrin-71. The largest possible bioactive progastrin product. *Eur. J. Biochem.*, 223 (1994) 765-773.
- 507 Saelson, L., Andersen, H.B., Bratholm, P. and Christensen, N.J.: Radioimmunoassay of plasma neuropeptide Y using HPLC for separation of related peptides and fragments. *Scand. J. Clin. Lab. Invest.*, 54 (1994) 207-214; C.A., 121 (1994) 27051w.
- 508 Stacey, C.C., Kruppa, G.H., Watson, C.H., Wronka, J., Laukien, F.H., Banks, J.F. and Whitehouse, C.M.: Reverse-phase liquid chromatography/electrospray-ionization Fourier-transform mass spectrometry in the analysis of peptides. *Rapid Commun. Mass Spectrom.*, 8 (1994) 513-516; C.A., 121 (1994) 129325f.
- 509 Straub, J.A., Akiyama, A., Parmar, P. and Musso, G.F.: Limited enzymatic digestion for the determination of the quantities of minor diastereomeric impurities in preparations of RMP-7, a peptide containing a reduced peptide bond. *J. Chromatogr. A*, 679 (1994) 85-91.
- 510 Teal, P.E.A. and Nachman, R.J.: Separation of neuropeptides by inverse gradient reversed-phase liquid chromatography on a bonded phenyl support. *Anal. Biochem.*, 221 (1994) 422-425.
- 511 Tetaert, D., Briand, G., Soudan, G., Richet, C., Demeyer, D., Boersma, A. and Degand, P.: Analysis by electrospray mass spectrometry of glycopeptides from *in vitro* oxyglycosylation reaction using human mucin motif peptide. *Anal. Biochem.*, 222 (1994) 409-416.
- 512 Török, A., Vecsernyes, M. and Penke, B.: Affinity chromatographic method for the extraction of oxytocin from human and rat plasma. *Eur. J. Clin. Chem. Clin. Biochem.*, 32 (1994) 595-598.
- 513 Veenstra, J.: Isolation and identification of three leucokinins from the mosquito *Aedes aegypti*. *Biochem. Biophys. Res. Commun.*, 202 (1994) 715-719.
- 514 Voelker, J.R., Cobb, S.L. and Bowsher, R.R.: Improved HPLC-radioimmunoassay for quantifying angiotensin II in plasma. *Clin. Chem. (Washington)*, 40 (1994) 1537-1543.
- 515 Wutte, A., Gübitz, G., Friebel, S. and Krauss, G.-J.: High-performance liquid chromatography of *cis-trans* isomers of proline-containing dipeptides. III. Comparative studies with different stationary phases. *J. Chromatogr. A*, 677 (1994) 186-191.
- 516 Wybrandt, G.B. and Andersen, S.O.: Cuticle-catalyzed coupling between polyamino acids and N-acetyldopamine. *Biochim. Biophys. Acta*, 1201 (1994) 15-18.
- 517 Yamaguchi, T., Umeda, F., Masakado, M., Isaji, M., Mizushima, S. and Nawata, H.: Purification and molecular cloning of prostacyclin-stimulating factor from serum-free conditioned medium of human diploid fibroblast cells. *Biochem. J.*, 303 (1994) 591-598.
- 518 Zhu, X. and Desiderio, D.M.: Peptidase inhibitors are not necessary in the analysis of neuropeptides. *Anal. Lett.*, 27 (1994) 2267-2280.

For additional information see C.A.:

121 (1994) 30504b, 132492p, 149249n, 196121z.

See also 65, 157, 293, 523, 525, 580, 646, 650, 675, 677, 730, 802, 805, 1021, 1225, 1226.

- 18c. Elucidation of structure of proteins and enzymes
- 519 Amons, R., Guerrucci, M.-A., Karssies, R.H., Morales, J., Cormier, P., Möller, W. and Bellé, R.: The leucine-zipper in elongation factor EF-1 α , a guanine-nucleotide exchange protein, is conserved in *Artemia* and *Xenopus*. *Biochim. Biophys. Acta*, 1218 (1994) 346-350.
- 520 Araki, K., Sasaki, J., Matsunaga, A., Takada, Y., Moriyama, K., Hidaka, K. and Arakawa, K.: Characterization of two new human apolipoprotein A-I variants: Apolipoprotein A-I Tsushima (Trp-108 \rightarrow Arg) and A-I Hita (Ala-95 \rightarrow Asp). *Biochim. Biophys. Acta*, 1214 (1994) 272-278.
- 521 Cao, Q.P., Pitt, S., Leszyk, J. and Baril, E.F.: DNA-Dependent ATPase from HeLa cells is related to human Ku autoantigen. *Biochemistry*, 33 (1994) 8548-8557.
- 522 Chang, J., Canals, F., Schindler, P., Querol, E. and Aviles, F.X.: The disulfide folding pathway of potato carboxypeptidase inhibitor. *J. Biol. Chem.*, 269 (1994) 22087-22094.
- 523 Chang, J.P., Richardson, J.M. and Riggin, R.M.: Characterization of tryptic peptides of a potent growth hormone releasing hormone analog by reversed phase high performance liquid chromatography-ionspray mass spectrometry. *J. Liq. Chromatogr.*, 17 (1994) 2881-2894.
- 524 De Wolf, M.J.S. and Dierick, W.S.H.: Regeneration of active receptor recognition domains on the B subunit of cholera toxin by formation of hybrids from chemically inactivated derivatives. *Biochim. Biophys. Acta*, 1223 (1994) 285-295.
- 525 DePaolis, A. and Sharma, B.: Tryptic map variation of erythropoietin resulting from carboxypeptidase B-like activity. *J. Liq. Chromatogr.*, 17 (1994) 2777-2789.
- 526 Fujii, N., Satoh, K., Harada, K. and Ishibashi, Y.: Simultaneous Stereoinversion and Isomerization at specific aspartic acid residues in α A-crystallin from human lens. *J. Biochem. (Tokyo)*, 116 (1994) 663-669.
- 527 Gill, D.S., Roush, D.J. and Willson, R.C.: Presence of a preferred anion-exchange binding site on cytochrome b₅: structural and thermodynamic considerations. *J. Chromatogr. A*, 684 (1994) 55-63.
- 528 Hattori, M., Adachi, H., Tsujimoto, M., Arai, H. and Inoue, K.: The catalytic subunit of bovine brain platelet-activating factor acetylhydrolase is a novel type of serine esterase. *J. Biol. Chem.*, 269 (1994) 23150-23155.
- 529 Hountondji, C., Gillet, S., Schmitter, J.-M., Fukui, T. and Blanquet, S.: Affinity labeling of the two species of *Escherichia coli* lysyl-tRNA synthetase with adenosine di- and triphosphopyridoxals. *J. Biochem. (Tokyo)*, 116 (1994) 493-501.
- 530 Johnson, R.S., Ohguro, H., Palczewski, K., Hurley, J.B., Walsh, K.A. and Neubert, T.A.: Heterogenous N-acylation is a tissue- and species-specific posttranslational modification. *J. Biol. Chem.*, 269 (1994) 21067-21071.
- 531 Lebreton, F., Delepiere, M., Ramirez, A.N., Balderas, C. and Possani, L.D.: Primary and NMR three-dimensional structure determination of a novel crustacean toxin from the venom of the scorpion *Centruroides limpidus limpidus* Karsch. *Biochemistry*, 33 (1994) 11135-11149.
- 532 Mansour, S.J., Resing, K.A., Candi, J.M., Hermann, A.S., Gloo, J.W., Herskind, K.R., Wartmann, M., Davis, R.J. and Ahn, N.G.: Mitogen-activated protein (MAP) kinase phosphorylation of MAP kinase kinase: determination of phosphorylation sites by mass spectrometry and site-directed mutagenesis. *J. Biochem. (Tokyo)*, 116 (1994) 304-314.
- 533 Mildner, A.M., Rothrock, D.J., Leone, J.W., Bannow, C.A., Lull, J.M., Reardon, I.M., Sarcich, J.L., Howe, W.J., Tomich, C.C., Smith, C.W. et al.: The HIV-1 protease as enzyme and substrate: mutagenesis of autolysis sites and generation of a stable mutant with retained kinetic properties. *Biochemistry*, 33 (1994) 9405-9413.
- 534 Negri, A., Tedeschi, G., Bonomi, F., Zhang, J.-H. and Kurtz, D.M., Jr.: Amino-acid sequences of the alpha- and beta-subunits of hemerythrin from *Lingula reevii*. *Biochim. Biophys. Acta*, 1208 (1994) 277-285.
- 535 Rasmussen, H.H., Mørz, E., Mann, M., Roepstorff, P. and Celis, J.E.: Identification of transformation sensitive proteins recorded in human two-dimensional gel protein databases by mass spectrometric peptide mapping alone and in combination with microsequencing. *Electrophoresis (Weinheim)*, 15 (1994) 406-416.
- 536 Roach, P.L., Baldwin, J.E., Aplin, R.T., Robinson, C.V. and Schofield, C.J.: Peptide mapping of the active site of *Bacillus cereus* β -lactamase I by the use of high pressure liquid chromatography coupled to electrospray ionization mass spectrometry. *J. Chem. Soc. Chem. Commun.*, (1994) 849-850; C.A., 121 (1994) 102930n.
- 537 Salih, E., Chishti, S.B., Vicedomine, P., Cohen, S.G., Chiara, D.C. and Cohen, J.B.: Active-site peptides of acetylcholinesterase of *Electrophorus electricus*: labelling of His-440 by 1-bromo-[2-¹⁴C]pinacolone and Ser-200 by tritiated diisopropyl fluorophosphate. *Biochim. Biophys. Acta*, 1208 (1994) 324-331.
- 538 Sommerlade, H.-J., Selmser, T., Ingendoh, A., Gieselmann, V., von Figura, K., Niefer, K. and Schmidt, B.: Glycosylation and phosphorylation of arylsulfatase A. *J. Biol. Chem.*, 269 (1994) 20977-20981.
- 539 Taneda, H., Andoh, K., Nishioka, J., Takeya, H. and Suzuki, K.: Blood coagulation factor Xa interacts with a linear sequence of the kringle 2 domain of prothrombin. *J. Biochem. (Tokyo)*, 116 (1994) 589-597.
- 540 Tsujimura, K., Tanaka, J., Ando, S., Matsuoka, Y., Kusubata, M., Sugiura, H., Yamauchi, T. and Inagaki, M.: Identification of phosphorylation sites on glial fibrillary acidic protein for cdc2 kinase and Ca²⁺-calmodulin-dependent protein kinase II. *J. Biochem. (Tokyo)*, 116 (1994) 426-434.
- 541 Wells, T.N.C., Scully, P. and Magnenat, E.: Arginine 304 is an active site residue in phosphomannose isomerase from *Candida albicans*. *Biochemistry*, 33 (1994) 5777-5782.

See also 58, 89, 494, 617, 655, 656, 667, 679.

19. PROTEINS

19a. General techniques

- 542 Berggrund, A., Drevin, I., Knuutila, K.G., Wardhammar, J. and Johansson, B.L.: Chemical and chromatographic characterization of a new BioProcess medium for hydrophobic interaction chromatography: Butyl Sepharose 4 Fast Flow. *Process Biochem. (Oxford)*, 29 (1994) 455-463; C.A., 121 (1994) 199905u.
- 543 Cameron, G.W.W. and Bruce, N.C.: Introduction to chromatographic methods for protein purification. *Methods Mol. Cell. Biol.*, 4 (1993) 184-188; C.A., 121 (1994) 152355z.
- 544 Choeng, H.S. and Kim, S.S.: Simple purification of recombinant human TNF- α by conventional chromatography. *Korean Biochem. J.*, 27 (1994) 330-334; C.A., 121 (1994) 177059u.
- 545 Coffman, J.L., Roper, D.K. and Lightfoot, E.N.: High-resolution chromatography of proteins in short columns and adsorptive membranes. *Bioseparation*, 4 (1994) 183-200; C.A., 121 (1994) 199924z.
- 546 Gaillard, I., Martial, A., Marc, A., Engasser, J.-M. and Fick, M.: Analytical method optimization for protein determination by fast high-performance liquid chromatography. *J. Chromatogr. A*, 679 (1994) 261-268.
- 547 Galaev, I.Yu., Warrol, C. and Mattiasson, B.: Temperature-induced displacement of proteins from dye-affinity columns using an immobilized polymeric displacer. *J. Chromatogr. A*, 684 (1994) 37-43.
- 548 Horvath, J., Boschetti, E., Guerrier, L. and Cooke, N.: High-performance protein separations with novel strong ion exchangers. *J. Chromatogr. A*, 679 (1994) 11-22.
- 549 Huddleston, J.G., Wang, R. and Lyddiatt, A.: On the use of mild hydrophobic interaction chromatography for "method scouting" protein purification strategies in aqueous two-phase systems: a study using model proteins. *Biotechnol. Bioeng.*, 44 (1994) 626-635; C.A., 121 (1994) 129055t.
- 550 Hunter, A.P. and Games, D.E.: Chromatographic and mass spectrometric methods for the identification of phosphorylation sites in phosphoproteins. *Rapid Commun. Mass Spectrom.*, 8 (1994) 559-570; C.A., 121 (1994) 129326g.
- 551 Iton, H., Nagae, N., Kinoshita, T. and Nimura, N.: Reversed-phase liquid chromatographic separation of proteins on a C30 alkyl bonded nonporous silica gel column. *Kuromatogurai*, 14 (1993) 89R-98R; C.A., 121 (1994) 53270m.
- 552 Jug, R.A. and Hale, J.E.: On-line procedures for alkylation of cysteine residues with 3-bromopropylamine prior to protein sequence analysis. *Anal. Biochem.*, 221 (1994) 374-378.
- 553 Lee, D.W. and Cho, B.Y.: Investigation of the retention behavior and structural change of proteins in reversed phase and hydrophobic interaction chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2541-2558.
- 554 Lee, W.C., Chuang, C.Y., Chen, C.L. and Chiu, C.Y.: High-performance affinity chromatography of proteins using non-porous silica beads. *Biotechnol. Tech.*, 8 (1994) 447-450; C.A., 121 (1994) 174258x.
- 555 Nenortas, E. and Beckett, D.: Reduced-scale large-zone analytical gel filtration chromatography for measurement of protein association equilibria. *Anal. Biochem.*, 222 (1994) 366-373.
- 556 Nicolas-Simonnot, M.O., Bailly, M. and Grevillot, G.: Investigation of ion exchange phenomena in frontal anion exchange chromatography of a protein. *Stud. Surf. Sci. Catal.*, 80(Fundamentals of Adsorption) (1993) 591-598; C.A., 121 (1994) 152453e.
- 557 O'Keefe, D.O.: Quantitative electrophoretic analysis of proteins labeled with monobromobimane. *Anal. Biochem.*, 222 (1994) 86-94.
- 558 Rott, G.M., Podgorodnichenko, V.K., Rozhynskaya, I.V. and Novikova, I.S.: (Anion exchange chromatography of proteins leads to induction of their DNA-binding activity). *Mol. Biol. (Moscow)*, 28 (1994) 383-391; C.A., 121 (1994) 102260u.
- 559 Shiosaki, A., Goto, M. and Hirose, T.: Frontal analysis of protein adsorption on a membrane adsorber. *J. Chromatogr. A*, 679 (1994) 1-9.
- 560 Soltes, L. and Sebille, B.: Study of macromolecule-ligand interactions by liquid-chromatographic separation methods under equilibrium and nonequilibrium conditions. *J. Liq. Chromatogr.*, 17 (1994) 2207-2230.
- 561 Takahashi, Y. and Goto, S.: Continuous separation and concentration of proteins using an annular chromatograph. *Stud. Surf. Sci. Catal.*, 80(Fundamentals of Adsorption) (1993) 639-646; C.A., 121 (1994) 152412r.
- 562 Wang, S. and Gao, R.: Counteracting chromatographic electrophoresis, a new process for purification of proteins. *Process Technol. Proc.*, 11(Separation Technology) (1994) 845-852; C.A., 121 (1994) 200154g.
- 563 Werner, M.H., Clore, G.M., Gronenborn, A.M., Kondoh, A. and Fisher, R.J.: Refolding proteins by gel filtration chromatography. *FEBS Lett.*, 345 (1994) 125-130; C.A., 121 (1994) 53292v.
- 564 Whitley, R.D., Zhang, X. and Wang, N.-H.L.: Protein denaturation in nonlinear isocratic and gradient elution chromatography. *AIChE J.*, 40 (1994) 1067-1081; C.A., 121 (1994) 77560g.
- 565 Wilchek, M., Knudsen, K.L. and Miron, T.: Improved method for preparing N-hydroxysuccinimide ester-containing polymers for affinity chromatography. *Bioconjugate Chem.*, 5 (1994) 491-492; C.A., 121 (1994) 174526h.
- 566 Xu, C. and Regnier, F.E.: Frontal immunoaffinity chromatography of protein variants. *Anal. Methods Instrum.*, 1 (1993) 145-152; C.A., 121 (1994) 199930y.
- 567 Yamaki, S., Izumi, T., Matsuoka, K., Kaji, H., Isobe, T. and Shioda, T.: (Analysis of heterogeneity in proteins by automated two-dimensional liquid chromatographic system). *Kuromatogurai*, 14 (1993) 66-67; C.A., 121 (1994) 30137j.

For additional information see C.A.:

121 (1994) 129027k, 174649a, 199920v.

See also 104, 602, 659, 684.

19b. Proteins of cells, viruses and subcellular particles

- 568 Corthesy, B. and Kao, P.N.: Purification by DNA affinity chromatography of two polypeptides that contact the NF-AT DNA binding site in the interleukin 2 promoter. *J. Biol. Chem.*, 269 (1994) 20682-20690.

- 569 Gehring, H.: Detection of mycoplasma contamination of cell cultures by reversed-phase high-performance liquid chromatography. *Anal. Biochem.*, 220 (1994) 430-431.
- 570 Hubbard, M.J. and Carne, A.: Differential feeding-related regulation of ubiquitin and calbindin₁₀₂ in rat duodenum. *Biochim. Biophys. Acta*, 1200 (1994) 191-196.
- 571 Minich, W.B., Balasta, M.L., Goss, D.J. and Rhoads, R.E.: Chromatographic resolution of *in vivo* phosphorylated and nonphosphorylated eukaryotic translation initiation factor eIF-4E: increased cap affinity of the phosphorylated form. *Proc. Natl. Acad. Sci. U.S.A.*, 91 (1994) 7668-7672; C.A., 121 (1994) 152460e.
- 572 Ogata, K., Kurahashi, A., Nishiyama, C. and Terao, K.: Presence and role of the 5S rRNA-L5 protein complex (5SRNP) in the threonyl- and histidyl-tRNA synthetase complex in rat liver cytosol. *Biochim. Biophys. Acta*, 1218 (1994) 388-400.
- 573 Rowling, P.J.E., McLaughlin, S.H., Pollock, G.S. and Freedman, R.B.: A single purification procedure for the major resident proteins of the ER lumen: endoplasmic, BiP, calreticulin and protein disulfide isomerase. *Protein Expression Purif.*, 5 (1994) 331-336; C.A., 121 (1994) 199926b.
- 574 Sigurdardottir, O. and Wiman, B.: Identification of a PAI-1 binding site in vitronectin. *Biochim. Biophys. Acta*, 1208 (1994) 104-110.
- 575 Tao, Y. and Chen, K.Y.: PCR-Based cloning of the full-length *Neurospora* eukaryotic initiation factor 5A cDNA: polyhistidine-tagging and overexpression for protein affinity binding. *Biochem. J.*, 302 (1994) 517-525.
- 576 Thinnies, F.P., Floerke, H., Winkelbach, H., Stadtmueller, U., Heiden, M., Karabinos, A., Hesse, D., Kratzin, H.D., Fleer, E. and Hilschmann, N.: Studies on human porin, part X. Channel active mammalian porin, purified from crude membrane fractions of human B lymphocytes or bovine skeletal muscle, reversibly binds the stilbene-disulfonate group of the chloride channel blocker DIDS. *Biol. Chem. Hoppe-Seyler*, 375 (1994) 315-322; C.A., 121 (1994) 128134f.
- 577 Wisniewski, J.R., Schulze, E. and Sapetto, B.: DNA Binding and nuclear translocation of insect high-mobility-group protein-1 (HMG1) proteins are inhibited by phosphorylation. *Eur. J. Biochem.*, 225 (1994) 687-693.
- For additional information see C.A.:
121 (1994) 174262w.
- 578 Abe, M., Abe, K., Iwabuchi, K., Domoto, C. and Arai, S.: Corn cystatin I expressed in *Escherichia coli*: investigation of its inhibitory profile and occurrence in corn kernels. *J. Biochem. (Tokyo)*, 116 (1994) 488-492.
- 579 Kosaka, T., Suzuki, N., Ishibashi, Y., Matsumoto, H., Itoh, Y., Ohkubo, S., Ogi, K., Kitada, C., Onda, H. and Fujino, M.: Biosynthesis of human endothelins in transformants expressing cDNAs for human prepro-endothelins. *J. Biochem. (Tokyo)*, 116 (1994) 443-449.
- 580 Lopatin, S.A., Ilyna, A.V., Shulga, A.A., Grinchenko, O.S., Varlamov, V.P., Skryabin, K.G. and Kirpichnikov, M.P.: (A universal method of isolation of recombinant somatotropin and its mutants using metal chelate affinity chromatography). *Biokhimiya (Moscow)*, 59 (1994) 226-230.
- 19d. *Microbial and plant proteins*
- 581 Alderton, W.K., Lowe, C.R. and Thatcher, D.R.: Purification of recombinant ricin A chain with immobilised triazine dyes. *J. Chromatogr. A*, 677 (1994) 289-299.
- 582 Ceccardi, T.L., Meyer, N.C. and Close, T.J.: Purification of a maize dehydrin. *Protein Expression Purif.*, 5 (1994) 266-269; C.A., 121 (1994) 53298b.
- 583 Chang, T.-m., Hossain, A. and Chang, C.H.L.: Effect of rate of intracellular transport and diacytosis on cytotoxicity of hybrid toxins. Study with hybrids using hepatic asialoglycoprotein receptor-mediated endocytosis. *Biochim. Biophys. Acta*, 1224 (1994) 77-88.
- 584 De Wolf, M.J.S., Dams, E. and Dierick, W.S.H.: Interaction of a cholera toxin derivative containing a reduced number of receptor binding sites with intact cells in culture. *Biochim. Biophys. Acta*, 1223 (1994) 296-305.
- 585 Goossens, A., Geremia, R., Bauw, G., van Montagu, M. and Angenon, G.: Isolation and characterization of arcelin-5 proteins and cDNAs. *Eur. J. Biochem.*, 225 (1994) 787-795.
- 586 Hader, D.-P. and Lebert, M.: Analysis of photoreceptor proteins of microorganisms by gradient gel electrophoresis and other biochemical separation methods. *Electrophoresis (Weinheim)*, 15 (1994) 1051-1061.
- 587 Lopes, H.R., Milhomem, A.M., Noleto, A.L.S. and Bergdoll, M.S.: Purification of staphylococcal enterotoxin A by dye ligand chromatography. *Rev. Microbiol.*, 24 (1993) 228-231; C.A., 121 (1994) 51588x.
- 588 Peleato, M.L., Ayora, S., Inda, L.A. and Gomez-Moreno, C.: Isolation and characterization of two different flavodoxins from the eukaryote *Chlorella fusca*. *Biochem. J.*, 302 (1994) 807-811.
- 589 Peruffo, A.D.B., Curioni, A., Pressi, G., Pogna, N.E. and Zarnorani, A.: Adsorption chromatography on controlled-pore glass beads of acetic-acid-soluble wheat gluten proteins. *Cereal Chem.*, 71 (1994) 122-129; C.A., 121 (1994) 33495k.
- 590 Phadtare, S., Fisher, M.T. and Yarbrough, L.R.: Refolding and release of tubulins by a functional immobilized groEL column. *Biochim. Biophys. Acta*, 1208 (1994) 189-192.
- 591 Schönherr, R., Hilger, M., Broer, S., Benz, R. and Braun, V.: Interaction of *Serratia marcescens* hemolysin (ShIA) with artificial and erythrocyte membranes. Demonstration of the formation of aqueous multistate channels. *Eur. J. Biochem.*, 223 (1994) 655-663.
- 592 Turner, J.B., Gordon, D.B., Garner, G.V., Lord, G.A. and Smith, C.A.: Purification of α -gliadins to apparent homogeneity. *Biochem. Soc. Trans.*, 22 (1994) 403S; C.A., 121 (1994) 199960h.
- 593 Vasconcelos, I.M., Tremtim, A., Guimaraes, J.A. and Carlini, C.R.: Purification and physicochemical characterization of soyatoxin, a novel toxic protein isolated from soybeans (*Glycine max*). *Arch. Biochem. Biophys.*, 312 (1994) 357-366.

- 594 Vu, L. and Huynh, Q.K.: Isolation and characterization of a 27-kDa antifungal protein from the fruits of *Diospyros texana*. *Biochem. Biophys. Res. Commun.*, 202 (1994) 666-672.
- For additional information see C.A.:
121 (1994) 129051p.
- See also 305, 578, 661, 662, 688.
- 19e. *Proteins of blood, serum and blood cells*
- 595 Beer, D.J., Yates, A.M. and Jack, G.W.: Development of enzyme-linked immunosorbent assays (ELISAs) for the detection of monoclonal antibody leakage from immunoaffinity chromatography matrices. *J. Immunol. Methods*, 173 (1994) 103-109; C.A., 121 (1994) 155002t.
- 596 Christensen, S. and Sottrup-Jensen, L.: Characterization of two serpins from bovine plasma and milk. *Biochem. J.*, 303 (1994) 383-390.
- 597 Curbelo, D., Gonzalez, G., Lage, A. and Facenda, E.: (Optimization of IOR-T3 purification by affinity chromatography). *Biotecnol. Apl.*, 10 (1993) 84-85; C.A., 121 (1994) 155049p.
- 598 Ermolenko, M.N. and Sviridov, O.V.: (Interaction of thyroid hormones with immunoglobulins isolated from human blood serum. II. Structural elements and location of the thyroxine-binding region in the immunoglobulin M molecule). *Biokhimiya (Moscow)*, 59 (1994) 88-95.
- 599 Falkenberg, C., Enghild, J.J., Thøgersen, I.B., Salvesen, G. and Akerström, B.: Isolation and characterization of fibronectin- α_1 -microglobulin complex in rat plasma. *Biochem. J.*, 301 (1994) 745-651.
- 600 Girault, J., Longueville, D., Malgouyat, J.M., Istlin, B., Lecomte, G. and Fourtillan, J.B.: Simultaneous quantitative measurement of a new platelet activating factor antagonist (BN 50730) and its two main metabolites in human plasma and urine by LC-MS. *Chromatographia*, 39 (1994) 228-238.
- 601 Gorkun, O.V., Veklich, Y.I., Medved', L.V., Henschen, A.H. and Weisel, J.W.: Role of the α C domains of fibrin in clot formation. *Biochemistry*, 33 (1994) 6986-6997.
- 602 Grandics, P.: Monoclonal antibody purification guide: part 1. *Am. Biotechnol. Lab.*, 12 (1994) 58-62; C.A., 121 (1994) 80486t.
- 603 Iino, M., Takeya, H., Nishioka, J., Nakagaki, T., Tamura, K. and Suzuki, K.: The role of human factor X activation peptide in activation of factor X by factor IXa. *J. Biochem. (Tokyo)*, 116 (1994) 335-340.
- 604 Iranzo, M., Marcilla, A., Elorza, M.V., Mormeneo, S. and Sentandreu, R.: Preparation of anti-protein and anti-mannan antisera against fungal cell wall by affinity chromatography. *Exp. Mycol.*, 18 (1994) 159-167; C.A., 121 (1994) 131830k.
- 605 Ishiwata, N., Takio, K., Katayama, M., Watanabe, K., Titani, K., Ikeda, Y. and Handa, M.: Alternatively spliced isoform of P-selectin is present *in vivo* as a soluble molecule. *J. Biol. Chem.*, 269 (1994) 23708-23715.
- 606 Mohammad, J. and Hjerten, S.: A simple and inexpensive chromatographic method for the purification of γ -globulin from human serum. *J. Biochem. Biophys. Methods*, 28 (1994) 321-327; C.A., 121 (1994) 155040d.
- 607 Onishi, T., Shimizu, T. and Kajikawa, T.: Simple and efficient purification of C-reactive protein from canine serum. *J. Vet. Med. Sci.*, 56 (1994) 417-419; C.A., 121 (1994) 53282s.
- 608 Poole, R.C. and Halestrap, A.P.: N-Terminal protein sequence analysis of the rabbit erythrocyte lactate transporter suggests identity with the cloned monocarboxylate transport protein MCT1. *Biochem. J.*, 303 (1994) 755-759.
- 609 Pu, X.P., Iwamoto, A., Nishimura, H. and Nagasawa, S.: Purification and characterization of a novel substrate for plasma kallikrein (PK-120) in human plasma. *Biochim. Biophys. Acta*, 1208 (1994) 338-343.
- 610 Raut, S., Corran, P.H. and Gaffney, P.J.: Ultra-rapid preparation of milligram quantities of the purified polypeptide chains of human fibrinogen. *J. Chromatogr. B*, 660 (1994) 390-394.
- 611 Rodriguez, P.E.A., Barra, J.L. and Cuman, F.A.: Glycolipids non-covalently bound to DEAE-Sephadex: use of the complexes for purification of IgM and IgG anti(Gal β 1 \rightarrow 3GalNAc-)ⁿ antibodies. *Biochem. Mol. Biol. Int.*, 33 (1994) 273-281; C.A., 121 (1994) 55396f.
- 612 Severina, I.S.: (Soluble guanylate cyclase of platelets: significance of heme in the mechanism of enzyme regulation and role of the enzyme in platelet aggregation). *Biokhimiya (Moscow)*, 59 (1994) 325-339.
- 613 Sviridov, O.V. and Ermolenko, M.N.: (Interaction of thyroid hormones with immunoglobulins isolated from human blood serum. I. Parameters of the complex formation and the nature of the binding reaction). *Biokhimiya (Moscow)*, 59 (1994) 78-87.
- 614 Valdes, R., Ramos, R., Horestein, A., Merino, M., Salma, N., Reyes, B., Seuret, N., Martinez, L. and Duarte, C.: Optimization of anion exchange chromatography for the purification of a mouse monoclonal antibody from ascitic fluid. *Biotecnol. Apl.*, 10 (1993) 65; C.A., 121 (1994) 155048n.
- For additional information see C.A.:
121 (1994) 29905b, 132390d, 155759v.
- See also 539.
- 19f. *Structural and muscle proteins*
- 615 All-Hilawie, E., Minchin, S.D. and Trayer, I.P.: Overexpression of human cardiac troponin-I and troponin-C in *Escherichia coli* and their purification and characterization. Two point mutations allow high-level expression of troponin-I. *Eur. J. Biochem.*, 225 (1994) 1195-1201.
- 616 Gutierrez, L.M., Zhao, X.-L. and Hosey, M.M.: Protein kinase C-mediated regulation of L-type Ca channels from skeletal muscle requires phosphorylation of the α_1 subunit. *Biochem. Biophys. Res. Commun.*, 202 (1994) 857-865.
- 617 Niybizi, C. and Eyre, D.R.: Structural characterization of cross-linking sites in type V collagen of bone. Chain specificities and heterotypic links to type I collagen. *Eur. J. Biochem.*, 224 (1994) 943-950.
- 618 Weser, U. and Kaup, Y.: Intact mummified bone alkaline phosphatase. *Biochim. Biophys. Acta*, 1208 (1994) 186-188.
- 619 Zhu, G.-G., Melkko, J., Risteli, J., Kauppila, A. and Risteli, L.: Differential processing of type I and type III procollagens in the tumour cysts and peritoneal ascitic fluid of patients with benign and malignant ovarian tumours. *Clin. Chim. Acta*, 229 (1994) 87-97.

See also 540.

19g. Protamines, histones and other nuclear proteins

- 620 Gianazza, E., Coari, P., Lovati, M.R., Manzoni, C., Ghibaudo, E. and Salmona, M.: The purification of histones by metal-chelate chromatography. *Anal. Biochem.*, 222 (1994) 505-507.

See also 794.

19h. Chromoproteins and metalloproteins

- 621 Böhm, B., Wilbrink, B., Kuettner, K.E. and Mollenhauer, J.: Structural and fractional comparison of anchorin CII (artilage annexin V) and muscle annexin V. *Arch. Biochem. Biophys.*, 314 (1994) 64-74.
- 622 Cefalu, W.T., Wang, Z.Q., Bell-Farrow, A., Kiger, F.D. and Izlar, C.: Glycohemoglobin measured by automated affinity HPLC correlates with both short-term and long-term antecedent glycemia. *Clin. Chem. (Washington)*, 40 (1994) 1317-1321.
- 623 Chatterjee, A., Butler, M., Blum, M. and Warner, A.H.: Characterization of parvalbumin cDNA clone and gene expression in normal and dystrophic mice of strain 129 ReJ. *Biochem. Cell Biol.*, 72 (1994) 70-77.
- 624 Fasching, P., Rohac, M., Waldhaeusl, W., Strelc, C., Nowotny, P. and Endler, A.T.: Influence of hyperlipidemia on Hb_{A1c} values. A comparison between HPLC and a new immunoturbidimetric assay. *Klin. Labor.*, 39 (1993) 1042-1045; *C.A.*, 121 (1994) 200193u.
- 625 Feuerlein, R.J. and Weber, R.E.: Rapid and simultaneous measurement of anodic and cathodic hemoglobins and ATP and GTP concentrations in minute quantities of fish blood. *J. Exp. Biol.*, 189 (1994) 273-277; *C.A.*, 121 (1994) 129036n.
- 626 Kautzky-Willer, A., Endler, A.T., Strelc, C., Graf, H. and Prager, R.: Glycated hemoglobin in hemodialysis patients with and without erythropoietin substitution: a method comparison. *Klin. Labor.*, 39 (1993) 1046-1048; *C.A.*, 121 (1994) 200194v.
- 627 Miedema, K.: Influence of hemoglobin variants on the determination of glycated hemoglobin. *Klin. Labor.*, 39 (1993) 1029-1032; *C.A.*, 121 (1994) 200192t.
- 628 Musatov, A. and Robinson, N.C.: Subunit analysis of bovine cytochrome bc₁ by reverse-phase HPLC and determination of the subunit molecular masses by electrospray ionization mass spectrometry. *Biochemistry*, 33 (1994) 10561-10567.
- 629 Niederau, C.M. and Reinauer, H.: Comparison of seven methods for the determination of glycated hemoglobins. *Klin. Labor.*, 39 (1993) 1009-1014; *C.A.*, 121 (1994) 200268x.
- 630 Niederau, C.M., Coe, A. and Katayama, Y.: Interference of non-glucose-adducts on the determination of glycated hemoglobins. *Klin. Labor.*, 39 (1993) 1015-1023; *C.A.*, 121 (1994) 200191s.
- 631 Okahashi, M., Cao, G.M. and Hoshino, T.: (Development of rapid determination method for glycated hemoglobin -IV-). *Kuromatogurafu*, 14 (1993) 72-75; *C.A.*, 121 (1994) 30138k.
- 632 Osawa, Y., Fellows, C.S., Meyer, C.A., Woods, A., Castoro, J.A., Cotter, R.J., Wilkins, C.L. and Hightet, R.J.: Structure of the novel heme adduct formed during the reaction of human hemoglobin with BrCCl₃ in red cell lysates. *J. Biol. Chem.*, 269 (1994) 15481-15487.

- 633 Pic, P., Ducrocq, R. and Girot, R.: (Separation of hemoglobins, F, Fac, S, C, A1c and determination of hemoglobin F using high performance liquid chromatography). *Ann. Biol. Clin.*, 52 (1994) 129-132; *C.A.*, 121 (1994) 199932a.

- 634 Shima, K. and Nagamine, Y.: Interlaboratory standardization of measurements of glycohemoglobins in Tokushima area. *Klin. Labor.*, 39 (1993) 1006-1008; *C.A.*, 121 (1994) 174245r.

- 635 Shorr, R.G.L., Cho, M.O. and Nho, K.: Fractionation of polyalkylene oxide-conjugated hemoglobin solutions so they do not produce hemoglobinuria in mammals. *PCT Int. Appl.* WO 94 09,027 (Cl. C07K3/12), 28 Apr. 1994, US Appl. 960,007, 13 Oct. 1992; 30 pp.; *C.A.*, 121 (1994) 53482g.

- 636 Xie, F. and Duda, C.: (Separation of hemoglobins F, Fac, S, C, A1c and determination of hemoglobin F using high performance liquid chromatography). *Curr. Sep.*, 13 (1994) 18-21; *C.A.*, 121 (1994) 199931z.

See also 527, 553.

19i. Proteins of glands, gland products, various zymogens (incl. milk proteins)

- 637 Dev, B.C., Sood, S.M., DeWind, S. and Slattery, C.W.: α -Casein and β -caseins in human milk micelles: structural studies. *Arch. Biochem. Biophys.*, 314 (1994) 329-336.

- 638 Gowda, D.C. and Davidson, E.A.: Isolation and characterization of novel mucin-like glycoproteins from cobra venom. *J. Biol. Chem.*, 269 (1994) 20031-20039.

- 639 Jinno, M.: Affinity chromatography for screening of sperms. *Jpn. Kokai Tokkyo Koho JP 06,178,634 [94,178,634] (Cl. A01K67/02)*, 28 Jun. 1994, Appl. 92/332,982, 14 Dec. 1992; 5 pp.; *C.A.*, 121 (1994) 174652w.

- 640 Mandal, A. and Bhattacharyya, A.K.: Collective isolation of two major, close molecular weight coagulum proteins occurring in human semen before liquefaction. *Int. J. Androl.*, 17 (1994) 63-67; *C.A.*, 121 (1994) 152452d.

- 641 Miura, S., Habu, A., Mochizuki, T., Yanaihara, C., Hong, Y.M., Ohkubo, R. and Yanaihara, N.: Purification procedure of immunoreactive cholecystokinin in yellow fin tuna hypothalamus. *Pept. Chem.*, 31st (1993) 133-136; *C.A.*, 121 (1994) 174251q.

- 642 Papoff, C.M., Law, A.J.R., Dalgleish, D.G. and Campus, R.L.: Determination of the composition of ovine casein by anion-exchange FPLC. *Sci. Tec. Latt.-Casearia*, 44 (1993) 273-291; *C.A.*, 121 (1994) 33413g.

- 643 Paz, C., Dada, L.A., Cornejo Maciel, M.F., Mele, P.G., Cymering, C.B., Neuman, I., Mendez, C.F., Finkelstein, C.V., Solano, A.R., Park, M. et al.: Purification of a novel 43-kDa protein (p43) intermediary in the activation of steroidogenesis from rat adrenal gland. *Eur. J. Biochem.*, 224 (1994) 709-716.

- 644 Qian, Z.Y., Fiat, A.M. and Jolles, P.: A fast method for the preparation of high amounts of sheep κ -casein. *Milchwissenschaft*, 49 (1994) 78-80; *C.A.*, 121 (1994) 33615z.

- 645 Takagi, T., Nakamura, A., Deguchi, R. and Kyozuka, K-i.: Isolation, characterization, and primary structure of three major proteins obtained from *Mytilus edulis* sperm. *J. Biochem. (Tokyo)*, 116 (1994) 598-605.

- 646 Tang, G., Chen, M. and Wu, H.: (Isolation and determination of crotin toxin by high performance gel filtration chromatography with photodiode array detector). *Sepu.*, 12 (1994) 244-246; *C.A.*, 121 (1994) 152472k.

See also 484, 531, 596.

19j. *Proteins of brain, cerebrospinal fluid and eye*

- 647 Gucquo, S., Jolles, P. and Schoentgen, F.: Relationships between molecular interactions (nucleotides, lipids and proteins) and structural features of the bovine brain 21-kDa protein. *Eur. J. Biochem.*, 225 (1994) 1203-1210.
- 648 Harhammer, R., Nürnberg, B., Spicher, K. and Schultz, G.: Purification of the G protein G_{13} from rat brain membranes. *Biochem. J.*, 303 (1994) 135-140.
- 649 Harhammer, R., Nürnberg, B., Spicher, K. and Schultz, G.: Rapid isolation of G_{13} from bovine brain membranes: supportive effect of ethylene glycol. *Biochem. Biophys. Res. Commun.*, 204 (1994) 835-840.
- 650 Kolbeck, R., Jungbluth, S. and Barde, Y.-A.: Characterisation of neurotrophin dimers and monomers. *Eur. J. Biochem.*, 225 (1994) 995-1003.
- 651 Kumari, K., Phanna, P., Ansari, N.H. and Srivastava, S.K.: High-performance liquid chromatography method for the determination of protein-glutathione mixed disulfide. *Anal. Biochem.*, 220 (1994) 374-376.
- 652 Parish, C.A. and Rando, R.R.: Functional significance of G protein carboxymethylation. *Biochemistry*, 33 (1994) 9986-9991.
- 653 Pazzaglia, C. and Avila, J.: Purification of brain microtubule-associated protein MAP1A. *Neurochem. Res.*, 19 (1994) 1195-1198; *C.A.*, 121 (1994) 199955k.

See also 526, 530, 658.

19k. *Proteins of neoplastic tissue and transformed cells*

- 654 Jagoda, E.M., Wen, M.-I.D., Yost, F.J., Schreiber, G.J. and Tu, J.-I.: An affinity column method for determination of the immunoreactivity of ^{131}I -chimeric L6 monoclonal antibody and comparison to *in vivo* tumor localization. *J. Immunol. Methods*, 173 (1994) 191-201; *C.A.*, 121 (1994) 152299j.
- 655 Ji, H., Whitehead, R.H., Reid, G.E., Moritz, R.L., Ward, L.D. and Simpson, R.J.: Two-dimensional electrophoretic analysis of proteins expressed by normal and cancerous human crypts: application of mass spectrometry to peptide-mass fingerprinting. *Electrophoresis (Weinheim)*, 15 (1994) 391-405.

19l. *Specific binding and receptor proteins*

- 656 Brown, J.C. and Jones, A.M.: Mapping the auxin-binding site of auxin-binding protein 1. *J. Biol. Chem.*, 269 (1994) 21136-21140.
- 657 Day, R.A., Ahluwalia, R. and Du, Y.: Novel analysis of penicillin-binding proteins using liquid chromatography. *LC-GC*, 12 (1994) 384-394; *C.A.*, 121 (1994) 174246s.
- 658 Gorodovikova, E.N. and Philippov, P.P.: (Study of a function of the calcium-binding protein p26 (recoverin) in bovine retina rod cells). *Biokhimiya (Moscow)*, 59 (1994) 582-588.
- 659 Hale, J.E. and Beidler, D.E.: Purification of humanized murine and murine monoclonal antibodies using immobilized metal-affinity chromatography. *Anal. Biochem.*, 222 (1994) 29-33.
- 660 Jung, S.-K. and Fujimoto, D.: A novel β -galactoside-binding lectin in adult rat kidney. *J. Biochem. (Tokyo)*, 116 (1994) 547-553.

- 661 Korthout, H.A.A.J., van der Hoeven, P.C.J., Wagner, M.J., van Hunnik, E. and de Boer, A.H.: Purification of the fusicoccin-binding protein from oat root plasma membrane by affinity chromatography with biotinylated fusicoccin. *Plant Physiol.*, 105 (1994) 1281-1288; *C.A.*, 121 (1994) 174271w.
- 662 Li, Z.-S., Noubhani, A.M., Boourbouloux, A. and Delrot, S.: Affinity purification of sucrose binding proteins from the plant plasma membrane. *Biochim. Biophys. Acta*, 1219 (1994) 389-397.
- 663 McClung, A.D., Carroll, A.D. and Battey, N.H.: Identification and characterization of ATPase activity associated with maize (*Zea mays*) annexins. *Biochem. J.*, 303 (1994) 709-712.
- 664 Morton, R.E. and Greene, D.J.: Enhanced detection of lipid transfer inhibitor protein activity by an assay involving only low density lipoprotein. *J. Lipid Res.*, 35 (1994) 2094-2099.
- 665 Nadano, D., Yasuda, T., Takeshita, H., Uchide, K. and Kishi, K.: Purification and characterization of human brain ribonuclease inhibitor. *Arch. Biochem. Biophys.*, 312 (1994) 421-428.
- 666 Podesta, A. and Montagnoli, G.: Specificity in protein-ligand interactions: a model from estrone-antisera binding. *Biochim. Biophys. Acta*, 1200 (1994) 291-296.
- 667 Regalado, F., Martínez, M.P., López de Haro, M.S. and Nieto, A.: Isolation and characterization of two isoforms of a retinoic acid-binding protein from rabbit epididymal secretions. *Biochim. Biophys. Acta*, 1200 (1994) 235-240.
- 668 Rehberg, E.F., Greenlee, K.A., Melchior, G.W. and Marotti, K.R.: Purification of human cholesterol ester transfer protein by affinity chromatography on immobilized triazine dyes. *Protein Expression Purif.*, 5 (1994) 285-290; *C.A.*, 121 (1994) 77556k.
- 669 Rohrer, S.P., Jacobson, E.B., Hayes, E.C., Birzin, E.T. and Schaeffer, J.M.: Immunoaffinity purification of avermectin-binding proteins from the free living nematode *Caenorhabditis elegans* and the fruitfly *Drosophila melanogastera*. *Biochem. J.*, 302 (1994) 339-345.
- 670 Sakai, S., Nakajima, M. and Yamaguchi, I.: Isolation of gibberellin-binding proteins by affinity chromatography. *Biosci., Biotechnol., Biochem.*, 58 (1994) 963-964; *C.A.*, 121 (1994) 53288y.
- 671 Sivaprasadarao, A., Boudjelal, M. and Findlay, J.B.C.: Solubilization and purification of the retinol-binding protein receptor from human placental membranes. *Biochem. J.*, 302 (1994) 245-251.
- 672 Smith, G.B. and Olsen, R.W.: Identification of a [^3H]muscimol photoaffinity substrate in the bovine γ -aminobutyric acid α receptor subunits. *J. Biol. Chem.*, 269 (1994) 20380-20387.
- 673 Wang, G. and Thomas, K.A.: Purification and characterization of a functional soluble fibroblast growth factor receptor 1. *Biochim. Biophys. Res. Commun.*, 203 (1994) 1781-1788.
- 674 Ward, L.D., Howlett, G.J., Discolo, G., Yasukawa, K., Hammacher, A., Moritz, R.L. and Simpson, R.J.: High affinity interleukin-6 receptor is a hexameric complex consisting of two molecules each of interleukin-6, interleukin-6 receptor, and gp-130. *J. Biol. Chem.*, 269 (1994) 23286-23289.
- 675 Yamauchi, K. and Tata, J.R.: Purification and characterization of a cytosolic thyroid-hormone-binding protein (CTBP) in *Xenopus* liver. *Eur. J. Biochem.*, 225 (1994) 1105-1112.
- 676 Zhang, R., Yang, X., Li, C. and Xu, X.: (Study of the DNA-binding properties of peptides containing a specified motif by high performance affinity chromatography). *Sepu*, 12 (1994) 297-298; *C.A.*, 121 (1994) 174269b.

- 677 Zwijnen, A., Blockx, H., van Arnhem, W., Willems, J., Fransen, L., Devos, K., Raymackers, J., van de Woerde, A. and Slegers, H.: Characterization of a rat C glioma-secreted follistatin-related protein (FRP). Cloning and sequence of the human homologue. *Eur. J. Biochem.*, 225 (1994) 937-946.

For additional information see C.A.:

121 (1994) 149252p.

See also 142, 304, 519, 570, 621, 793.

19m. Urinary proteins

For additional information see C.A.:

121 (1994) 129040j.

See also 600.

19n. Other proteins (incl. proteinous inhibitors of enzymic activity)

- 678 Awadé, A.C., Moreau, S., Mollé, D., Brûlé, G. and Maubois, J.-L.: Two-step chromatographic procedure for the purification of hen egg white ovomucin, lysozyme, ovotransferrin and ovalbumin and characterization of purified proteins. *J. Chromatogr. A*, 677 (1994) 279-288.
- 679 Bigg, H.F., Clark, I.M. and Cawston, T.E.: Fragments of human fibroblast collagenase: interaction with metalloproteinase inhibitors and substrates. *Biochim. Biophys. Acta*, 1208 (1994) 157-165.
- 680 DiCesare, P.E., Mörgelin, M., Mann, K. and Paulsson, M.: Cartilage oligomeric motif protein and thrombospondin 1 from articular cartilage, electron microscopic structure, and chondrocyte binding. *Eur. J. Biochem.*, 223 (1994) 927-937.
- 681 Fortes-Dias, C.L., Lin, Y., Ewell, J., Diniz, C.R. and Liu, T.: A photolipase A₂ inhibitor from the plasma of the South American rattlesnake (*Crotalus durissus terrificus*). Protein structure, genomic structure, and mechanism of action. *J. Biol. Chem.*, 269 (1994) 15646-15651.
- 682 García-Casado, G., Sanchez-Monge, R., Lopez-Otin, C. and Salcedo, G.: Rye inhibitors of animal α -amylases show different specificities, aggregative properties and IgE-binding capacities than their homologues from wheat and barley. *Eur. J. Biochem.*, 224 (1994) 525-531.
- 683 Hayayama, T., Yasuda, K. and Nishiyama, E.: Characterization of high-molecular-mass heat shock proteins and 42°C-specific heat shock proteins of murine cells. *Biochem. Biophys. Res. Commun.*, 204 (1994) 357-365.
- 684 Medzihradzky, K.F., Maltby, D.A., Hall, S.C., Settineri, C.A. and Burlingame, A.L.: Characterization of protein N-glycosylation by reversed-phase microbore liquid chromatography/electrospray mass spectrometry, complementary mobile phases, and sequential exoglycosidase digestion. *J. Am. Soc. Mass Spectrom.*, 5 (1994) 350-358; C.A., 121 (1994) 174264w.
- 685 Melrose, J., Rodgers, K. and Ghosh, P.: The preparation and use of biotinylated trypsin in western blotting for the detection of trypsin inhibitory proteins. *Anal. Biochem.*, 222 (1994) 34-43.

- 686 Ruggiero-Lopez, D., Manioc, C., Geourjon, C., Louisot, P. and Martin, A.: Purification and partial amino acid sequence of fuctinin, an endogenous inhibitor of fucosyltransferase activities. *Eur. J. Biochem.*, 224 (1994) 47-55.

See also 517, 522, 596.

20. ENZYMES AND ENZYME ACTIVITY ESTIMATION

- 687 Welling, G.W., Scheffer, A.J. and Welling-Wester, S.: Determination of enzyme activity by high-performance liquid chromatography. *J. Chromatogr. B*, 659 (1994) 209-225 - a review with 127 refs.
- 20a. Oxidoreductases
- 688 Bruchhaus, I. and Tannich, E.: Purification and molecular characterization of the NAD⁺-dependent acetaldehyde:alcohol dehydrogenase from *Entamoeba histolytica*. *Biochem. J.*, 303 (1994) 743-748.
- 689 Burdette, D. and Zeikus, J.G.: Purification of acetaldehyde dehydrogenases and alcohol dehydrogenases from *Thermo-aerobacter ethanolicus* 39E and characterization of the secondary-alcohol dehydrogenase (2° Adh) as a bifunctional alcohol dehydrogenase-acetyl-CoA reductive thioesterase. *Biochem. J.*, 302 (1994) 163-170.
- 690 Buters, J.T.M., Korzekwa, K.R., Kunze, K.L., Omata, Y., Hardwick, J.P. and Gonzalez, F.J.: cDNA-Directed expression of human cytochrome P450 CYP3A4 using baculovirus. *Drug Metab. Disp.*, 22 (1994) 688-692.
- 691 Danielsson, O., Shafiqat, J., Estonius, M. and Jörnvall, H.: Alcohol dehydrogenase class III contrasted to class I. Characterization of the cyclostome enzyme, the existence of multiple forms as for the human enzyme, and distant cross-series hybridization. *Eur. J. Biochem.*, 225 (1994) 1081-1088.
- 692 Ding, Z. and Xu, Y.: Purification and properties of cow splenic biliverdin reductase. *Prepar. Biochem.*, 24 (1994) 193-201.
- 693 Estonius, M., Hjelmqvist, L. and Jörnvall, H.: Diversity of vertebrate class I alcohol dehydrogenase. Mammalian and non-mammalian enzyme functions correlated through the structure of a ratite enzyme. *Eur. J. Biochem.*, 224 (1994) 373-378.
- 694 Feil, I.K., Lerch, H.P. and Schomburg, D.: Deletion variants of L-hydroxyisocaproate dehydrogenase. *Eur. J. Biochem.*, 223 (1994) 857-863.
- 695 Gärtner, D.E., Keilholz, W. and Seitz, H.U.: Purification, characterization and partial peptide microsequencing of progesterone 5 β -reductase from shoot cultures of *Digitalis purpurea*. *Eur. J. Biochem.*, 225 (1994) 1125-1132.
- 696 Hannaert, V., Callens, M., Opperdoes, F.R. and Michels, P.A.M.: Purification and characterization of the native and the recombinant *Leishmania mexicana* glycosomal glyceraldehyde-3-phosphate dehydrogenase. *Eur. J. Biochem.*, 225 (1994) 143-149.
- 697 Hernández-Díaz, F.J., Abreu, P., Diaz-Cruz, A.T. and Alonso, R.: Simultaneous HPLC analysis of tryptophan hydroxylase activity and serotonin metabolism in rat pineal gland: determination of its kinetic properties. *J. Liq. Chromatogr.*, 17 (1994) 2939-2950.

- 698 Itoh, N., Morinaga, N. and Kouzai, T.: Purification and characterization of a novel metal-containing nonheme bromoperoxidase from *Pseudomonas putida*. *Biochim. Biophys. Acta*, 1207 (1994) 208-216.
- 699 John, G.H., Hasler, J.A., He, Y.-a. and Halpert, J.R.: *Escherichia coli* expression and characterization of cytochromes P450, 2811, 281, and 285. *Arch. Biochem. Biophys.*, 314 (1994) 367-375.
- 700 Kunitoh, S., Tanaka, T., Imaoka, S., Funae, Y. and Monna, Y.: Contribution of cytochrome P450s to MEOS (microsomal ethanol-oxidizing system): a specific and sensitive assay of MEOS activity by HPLC with fluorescence labeling. *Alcohol Alcohol.*, 28 (1993) 63-68; C.A., 121 (1994) 29052w.
- 701 Kunow, J., Linder, D., Stetter, K.O. and Thauer, R.K.: F₄₂₀H₂:Quinone oxidoreductase from *Archaeoglobus fulgidus*. Characterization of a membrane-bound multisubunit complex containing FAD and iron-sulfur clusters. *Eur. J. Biochem.*, 223 (1994) 503-511.
- 702 Lübben, M., Arnaud, S., Castresana, J., Warne, A., Albracht, S.P.J. and Saraste, M.: A second terminal oxidase in *Sulfolobus acidocaldarius*. *Eur. J. Biochem.*, 224 (1994) 151-159.
- 703 Munro, A.W., Malarkey, K., McKnight, J., Thomson, A.J., Kelly, S.M., Price, N.C., Lindsay, J.G., Coggins, J.R. and Miles, J.S.: The role of tryptophan 97 of cytochrome P450 BM3 from *Bacillus megaterium* in catalytic function. Evidence against the covalent switching hypothesis of P-450 electron transfer. *Biochem. J.*, 303 (1994) 423-428.
- 704 Muratsubaki, H., Enomoto, K., Ichijoh, Y., Tezuka, T. and Katsumi, T.: Rapid purification of yeast cytoplasmic fumarate reductase by affinity chromatography of Blue Sepharose CL-6B. *Prepar. Biochem.*, 24 (1994) 289-296.
- 705 Ninfali, P. and Marioni, S.: Purification of glucose-6-phosphate dehydrogenase from rabbit reticulocytes by immunoaffinity chromatography. *Ital. J. Biochem.*, 43 (1994) 61-70; C.A., 121 (1994) 151868g.
- 706 Ottado, J., Arakaki, A.K., Calcaterra, N.B. and Cecarelli, E.A.: Expression, assembly and secretion of a fully active plant ferredoxin-NADP reductase by *Saccharomyces cerevisiae*. *Eur. J. Biochem.*, 225 (1994) 677-685.
- 707 Pesliakas, H., Zutautas, V., Baskeviciute, B.: Immobilized metal-ion affinity partitioning of NAD⁺-dependent dehydrogenases in poly(ethylene glycol)-dextran two-phase systems. *J. Chromatogr. A*, 678 (1994) 25-34.
- 708 Pontoppidan, B. and Kannangara, C.G.: Purification and partial characterization of barley glutamyl-tRNA^{Glu} reductase, the enzyme that directs glutamate to chlorophyll biosynthesis. *Eur. J. Biochem.*, 225 (1994) 529-537.
- 709 Roveri, A., Maiorino, M., Nisii, C. and Ursini, F.: Purification and characterization of phospholipid hydroperoxide glutathione peroxidase from rat testis mitochondrial membranes. *Biochim. Biophys. Acta*, 1208 (1994) 211-221.
- 710 Sato, K., Nakanishi, M., Deyashiki, Y., Hara, A., Matsuura, K. and Ohya, I.: Purification and characterization of dimeric dihydrodiol dehydrogenase from dog liver. *J. Biochem. (Tokyo)*, 116 (1994) 711-717.
- 711 Steinkuhler, C., Carri, M.T., Michel, G., Knoepfel, L., Weser, U. and Rotilio, G.: Copper-dependent metabolism of Cu,Zn-superoxide dismutase in human K562 cells. Lack of specific transcriptional activation and accumulation of a partially inactivated enzyme. *Biochem. J.*, 302 (1994) 687-694.
- 712 Van Schijndel, J.W.P.M., Barnett, P., Roelse, J., Vollenbroek, E.G.M. and Wever, R.: The stability and steady-state kinetics of vanadium chloroperoxidase from the fungus *Curvularia inaequalis*. *Eur. J. Biochem.*, 225 (1994) 151-157.
- 713 Wang, X.T., Dumoulin, M.J., Befani, O., Mondovi, B. and Mateescu, M.A.: Joint chromatographic purification of bovine serum ceruloplasmin and amineoxidase. *Prepar. Biochem.*, 24 (1994) 237-250.
- For additional information see C.A.:
121 (1994) 156021k.
- 20b. *Transferases (excl. E.C. 2.7.-.)*
- 714 Hayes, J.D., Nguyen, T., Judah, D.J., Petersson, D.G. and Neal, G.E.: Cloning of cDNAs from fetal rat liver encoding glutathione S-transferase Y_c polypeptides. The Y₂ subunit is expressed in adult rat liver resistant to the hepatocarcinogen aflatoxin B₁. *J. Biol. Chem.*, 269 (1994) 20707-20717.
- 715 Mera, N., Ohmori, S., Itahashi, K., Kiuchi, M., Igarashi, T., Rikitisa, T. and Kitada, M.: Immunochemical evidence for the occurrence of mu class glutathione S-transferase in human fetal livers. *J. Biochem. (Tokyo)*, 116 (1994) 315-320.
- 716 Pescaglini, M., Michel, V., Simmonds, H.A., Rocchigiani, M. and Pompucci, G.: Nicotinic acid phosphoribosyltransferase activity in human erythrocytes: studies using a new HPLC method. *Clin. Chim. Acta*, 229 (1994) 15-25.
- 717 Petrovic, S., Krajnovic-Ozretic, M. and Ozretic, B.: Isolation and properties of mitochondrial aspartate aminotransferase from red muscle of grey mullet, *Mugil auratus* Risso. *Biochim. Biophys. Acta*, 1207 (1994) 201-207.
- 718 Sato, F., Tsujita, T., Katagiri, Y., Yoshida, S. and Yamada, Y.: Purification and characterization of S-adenosyl-L-methionine:norlaurene 6-0-methyltransferase from cultured *Coptis japonica* cells. *Eur. J. Biochem.*, 225 (1994) 125-131.
- 719 Singh, R.N. and Mehta, K.: Purification and characterization of a novel transglutaminase from filarial nematode *Brugia malayi*. *Eur. J. Biochem.*, 225 (1994) 625-634.
- 720 Suzuki, H., Murakoshi, I. and Saito, K.: A novel O-tigloyltransferase for alkaloid biosynthesis in plants. Purification, characterization, and distribution in *Lupinus* plants. *J. Biol. Chem.*, 269 (1994) 15853-15860.
- 721 Tricot, C., Vander Wauven, C., Wattiez, R., Falmagne, P. and Stalon, V.: Purification and properties of a succinyltransferase from *Pseudomonas aeruginosa* specific for both arginine and ornithine. *Eur. J. Biochem.*, 224 (1994) 852-861.
- 722 Wetzel, A. and Sandermann, H., Jr.: Plant biochemistry of xenobiotics: isolation and characterization of a soybean O-glucosyltransferase of DDT metabolism. *Arch. Biochem. Biophys.*, 314 (1994) 323-328.
- 20c. *Transferases transferring phosphorus containing groups (E.C. 2.7.-.)*
- 723 Aukema, H.M., Davidson, L.A., Chang, W.-C., Lupton, J.R., Derr, J.N. and Chapkin, R.S.: Dietary modulation of rat colonic cAMP-dependent protein kinase activity. *Biochim. Biophys. Acta*, 1224 (1994) 51-60.

- 724 Collinson, R., Fearnley, I.M., Skehel, J.M., Runswick, M.J. and Walker, J.E.: ATP Synthase from bovine heart mitochondria: identification of proteolysis of sites in F_0 exposed by removal of F_1 and the oligomycin-sensitivity conferral protein. *Biochem. J.*, 303 (1994) 639-645.
- 725 Davies, S.P., Hawley, S.A., Woods, A., Carling, D., Haystead, T.A.J. and Hardie, D.G.: Purification of the AMP-activated protein kinase on ATP- γ -Sepharose and analysis of its subunit structure. *Eur. J. Biochem.*, 223 (1994) 351-357.
- 726 Dent, P., Chow, Y.-H., Wu, J., Morrison, D.K., Jove, R. and Sturgill, T.W.: Expression, purification and characterization of recombinant mitogen-activated protein kinase kinases. *Biochem. J.*, 303 (1994) 105-112.
- 727 Galaev, I.Yu., Garg, N. and Mattiasson, B.: Interaction of Cibacron Blue with polymers: implications for polymer-shielded dye-affinity chromatography of phosphofructokinase from baker's yeast. *J. Chromatogr. A*, 684 (1994) 45-54.
- 728 Henry, S.P. and Killilea, S.D.: Purification and characterization of bovine heart glycogen synthase kinase-3. *Prepar. Biochem.*, 24 (1994) 263-277.
- 729 Koegl, M., Kypta, R.M., Bergman, M., Altalo, K. and Courtneidge, S.A.: Rapid and efficient purification of Src homology 2 domain-containing proteins: Fyn, Csk and phosphatidylinositol 3-kinase p85. *Biochem. J.*, 302 (1994) 737-744.
- 730 Kracht, M., Shiroo, M., Marshall, C.J., Hsuan, J.J. and Saklatvala, J.: Interleukin-1 activates a novel protein kinase that phosphorylates the epidermal-growth-factor receptor peptide T669. *Biochem. J.*, 302 (1994) 897-905.
- 731 Micheli, V., Rocchigiani, M. and Pompucci, G.: An HPLC-linked assay of phosphoribosylpyrophosphate synthetase activity in the erythrocytes of adults and children with neurological disorders. *Clin. Chim. Acta*, 227 (1994) 79-86.
- 732 Mitra, S., Nath, D. and Majumder, G.C.: Purification and characterization of a protein kinase from goat sperm plasma membrane. *Biochem. Cell Biol.*, 72 (1994) 218-226.
- 733 Miwa, I., Kito, Y. and Okuda, J.: Purification and characterization of triokinase from porcine kidney. *Prepar. Biochem.*, 24 (1994) 203-223.
- 734 Nanmori, T., Taguchi, W., Kinugasa, M., Oli, Y., Sahara, S., Fukami, Y. and Kikkawa, U.: Purification and characterization of protein kinase C from a higher plant, *Brassica campestris* L. *Biochem. Biophys. Res. Commun.*, 203 (1994) 311-318.
- 735 Rempel, A., Bannasch, P. and Mayer, D.: Microheterogeneity of cytosolic and membrane-bound hexokinase II in Morris hepatoma 3924A. *Biochem. J.*, 303 (1994) 269-274.
- 736 Salvarelli, S., Munoz, S. and Conde, F.P.: Purification and characterization of a ribonuclease from *Aspergillus giganteus* IFO 5518, the gigantin. Immunological and enzymic comparison with alphasarcin. *Eur. J. Biochem.*, 225 (1994) 243-251.
- 737 Snyder, F.F., Jenuth, J.P., Dilay, J.E., Fung, E., Lightfoot, T. and Mably, E.R.: Secondary loss of deoxyguanosine kinase activity in purine nucleoside phosphorylase deficient mice. *Biochim. Biophys. Acta*, 1227 (1994) 33-40.
- 738 Steinbock, F., Choojun, S., Held, I., Roehr, M. and Kubicek, C.P.: Characterization and regulatory properties of a single hexokinase from the citric acid accumulating fungus *Aspergillus niger*. *Biochim. Biophys. Acta*, 1200 (1994) 215-223.
- 739 Toyoda, Y., Miwa, I., Kamiya, M., Ogiso, S. and Okuda, J.: Purification of rat liver glycokinase. *Prepar. Biochem.*, 24 (1994) 225-236.
- 740 Utsumi, T., Tokunaga, T., Horii, J., Edashige, K., Utsumi, K., Koga, D. and Ide, A.: Myristoylation of protein at a distinct position allows its phosphorylation by protein kinase C. *Arch. Biochem. Biophys.*, 313 (1994) 337-345.
- 741 Walsh, J.P., Suen, R., Lemaitre, R.N. and Glomset, J.A.: Arachidonoyl-diacylglycerol kinase from bovine testis. *J. Biol. Chem.*, 269 (1994) 21155-21164.
- 742 Watanabe, F., Teraoka, H., Iijima, S., Mimori, T. and Tsukada, K.: Molecular properties, substrate specificity and regulation of DNA-dependent protein kinase from Raji Burkitt's lymphoma cells. *Biochim. Biophys. Acta*, 1223 (1994) 255-260.

See also 532, 696, 835.

20d. *Hydrolases, acting on ester bonds (E.C. 3.1.-.)*

- 743 Arrese, E.L. and Wells, M.A.: Purification and properties of a phosphorylatable triacylglycerol lipase from the fat body of an insect, *Manduca sexta*. *J. Lipid Res.*, 35 (1994) 1652-1660.
- 744 Artashov, D.K., Gevantmakher, S.V., Vagina, O.N., Rozmukhamedova, B. and Davranov, K.D.: (Purification and properties of *Penicillium* sp. lipase in aqueous solutions and in reversed micelles in benzene). *Biokhimiya (Moscow)*, 59 (1994) 425-433.
- 745 Bauer, K.: Purification and characterization of the thyrotropin-releasing-hormone-degrading ectoenzyme. *Eur. J. Biochem.*, 224 (1994) 387-396.
- 746 Bayard, B., Bette-Bovillo, P. and Aliau, S.: Affinity purification and characterization of (2'-5')oligo(adenylate)-dependent RNase from mouse spleen. *Eur. J. Biochem.*, 223 (1994) 403-410.
- 747 Bornscheuer, U., Reif, O.-W., Lausch, R., Freitag, R., Schepel, T., Kolisis, F.N. and Menge, U.: Lipase of *Pseudomonas cepacia* for biotechnological purposes: purification, crystallization and characterization. *Biochim. Biophys. Acta*, 1201 (1994) 55-60.
- 748 Crevel, I., U, S., Carne, A. and Katan, M.: Purification and properties of zinc-metallo-phospholipase C from *Pseudomonas fluorescens*. *Eur. J. Biochem.*, 224 (1994) 845-852.
- 749 Hoppe, E., Berne, P.-F., Stock, D., Rasmussen, J.S., Moller, N.P.H., Ulrich, A. and Huber, R.: Expression, purification and crystallization of human phosphotyrosine phosphatase 1B. *Eur. J. Biochem.*, 223 (1994) 1069-1077.
- 750 Iwasaki, Y., Niwa, S., Nakano, H., Nagasawa, T. and Yamane, T.: Purification and properties of phosphatidylinositol-specific phospholipase C from *Streptomyces antibioticus*. *Biochim. Biophys. Acta*, 1214 (1994) 221-228.
- 751 Kawamura, M., Gotoda, T., Mori, N., Shimano, H., Kozaki, K., Harada, K., Shimada, M., Inaba, T., Watanabe, Y., Yazaki, Y. and Yamada, N.: Establishment of enzyme-linked immunosorbent assays for lipoprotein lipase with newly developed antibodies. *J. Lipid Res.*, 35 (1994) 1688-1697.
- 752 King, A.J., Andjelkovic, N., Hemmings, B.A. and Akhtar, M.: The phospho-opsin phosphatase from bovine rod outer segments. An insight into the mechanism of stimulation of type-2A protein phosphatase activity by protamine. *Eur. J. Biochem.*, 225 (1994) 383-394.

- 753 Ma, Y., Henderson, H.E., Liu, M.-S., Zhang, H., Forsythe, I.J., Clarke-Lewis, I., Hayden, M.R. and Brunzell, J.D.: Mutagenesis in four candidate heparin binding regions (residues 279-282, 291-304, 390-393, and 439-448) and identification of residues affecting heparin binding of human lipoprotein lipase. *J. Lipid Res.*, 35 (1994) 2049-2059.
- 754 Minguez-Mosquera, M.I., Gandul-Rojas, B. and Gallardo-Guerrero, L.: Measurement of chlorophyllase activity in olive fruit (*Olea europaea*). *J. Biochem. (Tokyo)*, 116 (1994) 263-268.
- 755 Moorhead, G.B.G., Hodgson, R.J. and Plaxton, W.C.: Copurification of cytosolic fructose-1,6-bisphosphatase and cytosolic aldolase from endosperm of germinating castor oil seeds. *Arch. Biochem. Biophys.*, 312 (1994) 326-335.
- 756 Mounier, C., Vargaftig, B.B., Franken, P.A., Verheij, H.M., Bon, C. and Touqui, L.: Platelet secretory phospholipase A₂ fails to induce rabbit platelet activation and to release arachidonic acid in contrast with venom phospholipases A₂. *Biochim. Biophys. Acta*, 1214 (1994) 88-96.
- 757 Ohmori, H., Kuba, M. and Kumon, A.: 3-Phosphohistidine/6-phospholysine phosphatase from rat brain as acid phosphatase. *J. Biochem. (Tokyo)*, 116 (1994) 380-385.
- 758 Pete, M.J., Ross, A.H. and Exton, J.H.: Purification and properties of phospholipase A₁ from bovine brain. *J. Biol. Chem.*, 269 (1994) 19494-19500.
- 759 Previato, L., Guardamagna, O., Dugi, K.A., Ronan, R., Talley, G.D., Santamarina-Fojo, S. and Brewer, H.B., Jr.: A novel missense mutation in the C-terminal domain of lipoprotein lipase (Glu410142Val) leads to enzyme inactivation and familial chylomicronemia. *J. Lipid Res.*, 35 (1994) 1552-1560.
- 760 Ramanadham, S., Wolf, M.J., Jett, P.A., Gross, R.W. and Turk, J.: Characterization of an ATP-stimulatable Ca²⁺-independent phospholipase A₂ from clonal insulin-secreting HIT cells and rat pancreatic islets: a possible molecular component of the β-cell fuel sensor. *Biochemistry*, 33 (1994) 7442-7452.
- 761 Shapovalova, N.I., Zheleznyaya, L.A., Matvienko, N.N. and Matvienko, N.I.: (New site-specific endonuclease BspKT51). *Biokhimiya (Moscow)*, 59 (1994) 485-493.
- 762 Shiotsuki, T., Huang, T.L., Uematsu, T., Bonning, B.C., Ward, V.K. and Hammock, B.D.: Juvenile hormone esterase purified by affinity chromatography with 8-mercapto-1,1,1-trifluoro-2-octanone as a rationally designed ligand. *Protein Expression purif.*, 5 (1994) 296-306; *C.A.*, 121 (1994) 199083z.
- 763 Tsujita, T. and Okuda, H.: The synthesis of fatty acid ethyl ester by carboxyester lipase. *Eur. J. Biochem.*, 224 (1994) 57-62.
- 764 Zeggari, M., Esteve, J.-P., Rauly, I., Cambillau, C., Mazarguil, H., Dufresne, M., Pradayrol, L., Chayvialle, J.-A., Vaysse, N. and Susini, C.: Co-purification of a protein tyrosine phosphatase with activated somatostatin receptors from rat pancreatic acinar membranes. *Biochem. J.*, 303 (1994) 441-448.
- For additional information see *C.A.*:
121 (1994) 76820e.
- See also 528, 537, 538, 618, 725, 804.
- See also 148, 288.
- 20e. *Hydrolases acting on glycosyl compounds (E.C. 3.2.-.-)*
- 765 Christokopoulos, P., Goodenough, P.W., Kekos, D., Macris, B.J., ClaeysSENS, M. and Bhat, M.K.: Purification and characterization of an extracellular β-glucosidase with transglycosylation and exo-glucosidase activities from *Fusarium oxysporum*. *Eur. J. Biochem.*, 224 (1994) 379-385.
- 766 Dong, D.L.-Y. and Hart, G.W.: Purification and characterization of an O-GlcNAc selective N-acetyl-β-D-glucosaminidase from rat spleen cytosol. *J. Biol. Chem.*, 269 (1994) 19321-19330.
- 767 Gehrmann, M.C., Opper, M., Sedlacek, H.H., Bosslet, K. and Czech, J.: Biochemical properties of recombinant human β-glucuronidase synthesized in baby hamster kidney cells. *Biochem. J.*, 301 (1994) 821-828.
- 768 Kitajima, K., Kuroyanagi, H., Inoue, S., Ye, J., Troy, II, F.A. and Inoue, Y.: Discovery of a new type of sialidase, "KDNaSe," which specifically hydrolyzes deaminoneuraminyl (3-deoxy-D-glycero-D-galacto-2-nonuloseic acid) but not N-acylneuraminyl linkages. *J. Biol. Chem.*, 269 (1994) 21415-21419.
- 769 Li, H. and Li, H.: (Rapid purification of α-amylase by ion exchange chromatography). *Sepu*, 12 (1994) 89-91; *C.A.*, 121 (1994) 102653z.
- 770 Manin, C., Shareek, F., Morosoli, R. and Kluepfel, D.: Purification and characterization of an α-L-arabinofuranoside from *Streptomyces lividans* 66 and DNA sequence of the gene (abfA). *Biochem. J.*, 302 (1994) 443-449.
- 771 Sakai, N., Inui, K., Midorikawa, M., Okuno, Y., Ueda, S., Iwamatsu, A. and Okada, S.: Purification and characterization of galactocerebrosidase from human lymphocytes. *J. Biochem. (Tokyo)*, 116 (1994) 615-620.
- 772 Shirokane, Y., Arai, A. and Uchida, R.: A new enzyme, malto-bionate α-glucohydrolase, from alkalophilic *Bacillus* sp. N-1053. *Biochim. Biophys. Acta*, 1207 (1994) 143-151.
- 773 Tomizawa, H., Yamada, H., Ueda, T. and Imoto, T.: Isolation and characterization of 101-succinimide lysozyme that possesses the cyclic imide at Asp101-Gly102. *Biochemistry*, 33 (1994) 8770-8774.
- 774 Venerando, B., Fiorilli, A., Di Francesco, L., Chiarini, A., Monti, E., Zizioli, D. and Tettamanti, G.: Cytosolic sialidase from pig brain: a 'protein complex' containing catalytic and protective units. *Biochim. Biophys. Acta*, 1208 (1994) 229-237.
- 775 Akama, K., Terao, K., Tanaka, Y., Noguchi, A., Yonezawa, N., Nakano, M. and Tobita, T.: Purification and characterization of a novel acrosin-like enzyme from boar cauda epididymal sperm. *J. Biochem. (Tokyo)*, 116 (1994) 464-470.
- 776 Arao, M., Yamaguchi, T., Sugimoto, T., Fukase, M. and Chihara, K.: Characterization of a chymotrypsin-like hydrolytic activity in the opossum kidney cell. *Biochem. Cell Biol.*, 72 (1994) 157-162.
- 777 Azaryan, A.V. and Hook, V.Y.H.: Distinct properties of prohormone thiol protease (PTP) compared to cathepsins B, L, and H: evidence for PTP as a novel cysteine protease. *Arch. Biochem. Biophys.*, 314 (1994) 171-177.

- 778 Bedi, G.S.: Purification and characterization of lysine- and arginine-specific gingivain proteases from *Porphyromonas gingivalis*. *Prepar. Biochem.*, 24 (1994) 251-261.
- 779 Burton, N.P. and Lowe, C.R.: Design of novel cationic ligands for the purification of trypsin-like proteases by affinity chromatography. *J. Mol. Recognit.*, 6 (1993) 31-40; *C.A.*, 121 (1994) 199062s.
- 780 Chu, Y., Wilson, S.E. and Schlender, K.K.: A latent form of protein phosphatase 1 α associated with bovine heart myofibrils. *Biochim. Biophys. Acta*, 1208 (1994) 45-54.
- 781 Collinson, I.R., Runswick, M.J., Buchanan, S.K., Fearnley, I.M., Skehel, J.M., van Raaij, M.J., Griffiths, D.E. and Walker, J.E.: Fo Membrane domain of ATP synthase from bovine heart mitochondria: purification, subunit composition, and reconstitution with F₁-ATPase. *Biochemistry*, 33 (1994) 7971-7978.
- 782 De Felice, C., Hayakawa, K., Tanaka, T., Watanabe, T., Hibi, I., Kohsaka, T. and Itoh, K.: High-performance liquid chromatographic assay for biotinidase activity in the human urine. *J. Liq. Chromatogr.*, 17 (1994) 2641-2650.
- 783 Dumont, L., Verneuil, B., Wallach, J. and Julien, R.: Purification and characterization of an alkaline elastase from *Myxococcus xanthus*. *Eur. J. Biochem.*, 223 (1994) 775-782.
- 784 Escobar, W.A., Miller, J. and Fink, A.L.: Effects of site-specific mutagenesis of tyrosine 105 in a class A β -lactamase. *Biochem. J.*, 303 (1994) 555-558.
- 785 Grzywnowicz, K. and Lobarzewski, J.: A purification method for specific serine proteases using one-step affinity chromatography. *J. Chem. Technol. Biotechnol.*, 60 (1994) 153-160; *C.A.*, 121 (1994) 151849b.
- 786 Karasawa, K., Kato, H., Setaka, M. and Nojima, S.: Accumulation of platelet-activating factor acetylhydrolase in the peritoneal cavity of guinea pig after endotoxin shock. *J. Biochem. (Tokyo)*, 116 (1994) 368-373.
- 787 Karasawa, K., Yato, M., Setaka, M. and Nojima, S.: Purification and characterization of platelet-activating factor acetylhydrolase from peritoneal fluid obtained from guinea pigs after endotoxin shock. *J. Biochem. (Tokyo)*, 116 (1994) 374-379.
- 788 Laliberte, J. and Momparler, R.L.: Human cytidine deaminase: purification of enzyme, cloning, and expression of its complementary DNA. *Cancer Res.*, 54 (1994) 5401-5407.
- 789 Napper, A.D., Bennett, S.P., Borowski, M., Holdridge, M.B., Leonard, M.J.C., Rogers, E.E., Duan, Y., Laursen, R.A., Reinhold, B. and Shames, S.L.: Purification and characterization of multiple forms of the pineapple-stem-derived cysteine proteinases ananain and comosain. *Biochem. J.*, 301 (1994) 727-735.
- 790 Ogawa, J. and Shimizu, S.: β -Ureidopropionase with N-carbamoyl- α -L-amino acid amidohydrolase activity from an aerobic bacterium, *Pseudomonas putida* IFO 12996. *Eur. J. Biochem.*, 223 (1994) 625-630.
- 791 Ohshita, T. and Kido, H.: Involvement of a cystatine- α -sensitive cysteine proteinase in the degradation of native L-lactate dehydrogenase and serum albumin by rat liver or kidney lysosomes. *Eur. J. Biochem.*, 225 (1994) 781-786.
- 792 Pshezhetsky, A.V. and Potier, M.: Direct affinity purification and supramolecular organization of human lysosomal cathepsin A. *Arch. Biochem. Biophys.*, 313 (1994) 64-70.
- 793 Romes, T. and Höltje, J.-V.: Penicillin-binding protein 7/8 of *Escherichia coli* is a DD-endopeptidase. *Eur. J. Biochem.*, 224 (1994) 597-604.
- 794 Sanchez del Pino, M.M., Lopez-Rodas, G., Sendra, R. and Tornera, V.: Properties of the yeast nuclear histone deacetylase. *Biochem. J.*, 303 (1994) 723-729.
- 795 Schoyen, H., Wassdal, I., Toft, K., Almendingen, M. and Berg, T.: Purification of enzymes of the kallikrein gene family (rK8 and rK9) from the rat prostate. *Biochem. J.*, 302 (1994) 229-235.
- 796 Sharoyan, S.G., Antonyan, A.A. and Mardanyan, S.S.: (Isolation, purification and comparative characteristics of adenosine deaminase from five divisions of bovine brain). *Biokhimiya (Moscow)*, 59 (1994) 240-245.
- 797 Stewart, A.E., Arfin, S.M. and Bradshaw, R.A.: Protein NH₂-terminal asparagine deamidase. Isolation and characterization of a new enzyme. *J. Biol. Chem.*, 269 (1994) 23509-23517.
- 798 Wang, W., Hendriks, D.F. and Schärpe, S.S.: Carboxypeptidase U, a plasma carboxypeptidase with high affinity for plasminogen. *J. Biol. Chem.*, 269 (1994) 15937-15944.
- 799 Werlen, R.C., Offord, R.E. and Rose, K.: Preparation and characterization of novel substrates of insulin proteinase (EC. 3.4.99.45). *Biochem. J.*, 302 (1994) 907-911.
- 800 Yang, S.-H., Wu, X.-H. and Lin, W.Y.: Chemical modification of aminopeptidase isolated from pronase. *Biochem. J.*, 302 (1994) 595-600.
- 801 Zuo, S., Guo, Q. and Chang, Y.-H.: A protease assay via precolumn derivatization and high-performance liquid chromatography. *Anal. Biochem.*, 222 (1994) 514-516.

See also 521, 533, 609, 679.

20g. Lyases

- 802 Böttcher, K., Waheed, A. and Sly, W.S.: Membrane-associated carbonic anhydrase from the crab gill: purification, characterization and comparison with mammalian CAs. *Arch. Biochem. Biophys.*, 312 (1994) 429-435.
- 803 Chu, W.-C. and Metzler, D.E.: Enzymatically active truncated cat brain glutamate decarboxylase: expression, purification, and absorption spectrum. *Arch. Biochem. Biophys.*, 313 (1994) 287-295.
- 804 Heller, M., Bütkofer, P. and Brodbeck, U.: Generation by limited proteolysis of a catalytically active 39-kDa protein from the 115-kDa form a phosphatidylinositol-glycan-specific phospholipase D from bovine serum. *Eur. J. Biochem.*, 224 (1994) 823-833.
- 805 Huang, W.-Y., Chirala, S.S. and Wakil, S.J.: Amino-terminal blocking group and sequence of the animal fatty acid synthase. *Arch. Biochem. Biophys.*, 314 (1994) 45-49.
- 806 James, K.D., Russell, R.J.M., Parker, L., Daniel, R.M., Hough, D.W. and Danson, M.J.: Citrate synthases from the Archaea: development of a bio-specific, affinity chromatography purification procedure. *FEMS Microbiol. Lett.*, 119 (1994) 181-186; *C.A.*, 121 (1994) 102665e.
- 807 Lee, H.J., Lin, C.-C., Chiou, S.-H. and Chang, G.-G.: Characterization of the multiple forms of duck lens δ -crystallin with endogenous argininosuccinate lyase activity. *Arch. Biochem. Biophys.*, 314 (1994) 31-38.
- 808 Li, B. and Chollet, R.: Salt induction and the partial purification/characterization of phosphoenolpyruvate carboxylase protein-serine kinase from an inducible crassulacean-acid metabolism (CAM) plant, *Mesembryanthemum crystallinum* L. *Arch. Biochem. Biophys.*, 314 (1994) 247-254.

- 809 Peak, M.J., Peak, J.G., Stevens, F.J., Blamey, J., Mai, X., Zhou, Z.H. and Adams, M.W.W.: The hyperthermophilic glycolytic enzyme enolase in the archaeon, *Pyrococcus furiosus*: comparison with mesophilic enolases. *Arch. Biochem. Biophys.*, 313 (1994) 280-286.
- 810 Yu, S.M.: Thaloperphine selectively inhibits expression of the inducible, but not the constitutive, nitric oxide synthase. *Biochem. J.*, 303 (1994) 283-294.
- See also 755.
- 20h. Isomerases
- 811 Park, S.M. and Koo, H.-S.: Purification of *Caenorhabditis elegans* DNA topoisomerase I. *Biochim. Biophys. Acta*, 1219 (1994) 47-54.
- See also 541.
- 20i. Ligases
- 812 Bespalova, L.A., Korshunova, V.E., Antonyuk, L.P. and Ignatov, V.V.: (Isolation, purification and some kinetic properties of glutamine synthetase in the average state of adenylation from *Azospirillum brasilense* sp. 245). *Biokhimiya (Moscow)*, 59 (1994) 55-61.
- 813 Chiba, Y., Suzuki, Y., Aoki, Y., Ishida, Y. and Narisawa, K.: Purification and properties of bovine liver holocarboxylase synthetase. *Arch. Biochem. Biophys.*, 313 (1994) 8-14.
- 814 Dehaye, L., Alban, C., Job, C., Douce, R. and Job, D.: Kinetics of the two forms of acetyl-CoA carboxylase from *Pisum sativum*. Correlation of the substrate specificity of the enzymes and sensitivity towards aryloxyphenoxypropionate herbicides. *Eur. J. Biochem.*, 225 (1994) 1113-1123.
- 815 Pajares, M.A., Duran, C., Corrales, F. and Mato, J.M.: Protein kinase C phosphorylation of rat liver S-adenosylmethionine synthetase: dissociation and production of an active monomer. *Biochem. J.*, 303 (1994) 949-955.
- See also 529.
- 20j. Complex mixtures and incompletely identified enzymes
- 816 Avakyan, S.A., Boyaiyan, A.S., Pogosyan, A.G. and Karagezyan, K.G.: (Prostaglandin D₂-synthase from bovine brain: purification and physico-chemical properties). *Biokhimiya (Moscow)*, 59 (1994) 251-258.
- 817 Kal'cheva, E.O., Shanskaya, V.O. and Malyuta, S.S.: (Analysis of key enzyme activities of the aspartate family amino acid biosynthesis in *Streptococcus bovis*). *Biokhimiya (Moscow)*, 59 (1994) 96-101.
21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS
- 21a. Purines, pyrimidines, nucleosides, nucleotides
- 818 Arabshahi, A. and Frey, P.A.: A simplified procedure for synthesizing nucleoside 1-thiotriphosphates: dATP_αS, dGTP_αS, UTP_αS and dTTP_αS. *Biochem. Biophys. Res. Commun.*, 204 (1994) 150-155.
- 819 Bernocchi, P., Ceconi, C., Cargnoni, A., Pedersini, P., Curello, S. and Ferrari, R.: Extraction and assay of creatine phosphate, purine, and pyridine nucleotides in cardiac tissue by reversed-phase high-performance liquid chromatography. *Anal. Biochem.*, 222 (1994) 374-379.
- 820 Bleicher, K. and Bayer, E.: Analysis of oligonucleotides using coupled high performance liquid chromatography-electrospray mass spectrometry. *Chromatographia*, 39 (1994) 405-408.
- 821 Dale, C.J. and Lyddiatt, A.: Quantitative analysis of purine nucleosides and free bases in wort and beer. *J. Inst. Brew.*, 100 (1994) 173-178; C.A., 121 (1994) 177999a.
- 822 Damha, M.J., Giannaris, P.A. and Marfey, P.: Antisense L/D-oligodeoxynucleotide chimeras: nuclease stability, base-pairing properties, and activity at directing ribonuclease H. *Biochemistry*, 33 (1994) 7877-7885.
- 823 Downs, S.M.: High performance liquid chromatography analysis of hypoxanthine metabolism in mouse oocyte-cumulus cell complexes: effects of purine metabolic perturbants. *Biol. Reprod.*, 50 (1994) 1403-1412; C.A., 121 (1994) 30146m.
- 824 Geisen, K., Utz, R., Grötsch, H., Lang, H.J. and Nimmersgern, H.: Sorbitol-accumulating pyrimidine derivatives. *Arzneim.-Forsch.*, 44 (1994) 1032-1043.
- 825 Guiel, R., Paganelli, F., Sampieri, F., Bechis, G., Levy, S. and Rochat, H.: The use of HPLC to evaluate the variations of blood coronary adenosine levels during percutaneous transluminal angioplasty. *Clin. Chim. Acta*, 230 (1994) 63-68.
- 826 Guiel, R., Sampieri, F., Bechis, G. and Rochat, H.: Use of HPLC to measure circulating adenosine levels in migrainous patients. *Clin. Chim. Acta*, 227 (1994) 185-194.
- 827 Hull, S.R. and Montgomery, R.: Separation and analysis of 4'-epimeric UDP-sugars, nucleotides, and sugar phosphates by anion-exchange high performance liquid chromatography with conductometric detection. *Anal. Biochem.*, 222 (1994) 49-54.
- 828 Imai, Y., Yanagishita, M. and Hascall, V.C.: Measurement of contribution form intracellular cysteine to sulfate in phosphoadenosine phosphosulfate in rat ovarian granulosa cells. *Arch. Biochem. Biophys.*, 312 (1994) 392-400.
- 829 Jeong, S.-S. and Gready, J.E.: A method of preparation and purification of (4R)-deuterated-reduced nicotinamide adenine dinucleotide phosphate. *Anal. Biochem.*, 221 (1994) 273-277.
- 830 Loregian, A., Scrimin, C., Schiavon, M., Marcello, A. and Palu, G.: Quantitative analysis of ribonucleotide triphosphates in cell extracts by high-performance liquid chromatography and micellar electrokinetic capillary chromatography: a comparative study. *Anal. Chem.*, 66 (1994) 2981-2984.
- 831 Mirzayans, R., Enns, L., Cubitt, S., Karimian, K., Radatus, B. and Paterson, M.C.: Effect of DNA polymerase inhibitors on repair of γ ray-induced DNA damage in proliferating (intact versus permeable) human fibroblasts: evidence for differences in the modes of action of aphidicolin and 1- β -D-arabinofuranosylcosine. *Biochim. Biophys. Acta*, 1227 (1994) 92-100.

- 832 Misra, R.R., Chiang, S.Y. and Swenberg, J.A.: A comparison of two ultrasensitive methods for measuring 1,N⁶-etheno-2'-deoxyadenosine and 3,N⁴-etheno-2'-deoxycytidine in cellular DNA. *Carcinogenesis*, 15 (1994) 1647-1652; *C.A.*, 121 (1994) 197759a.
- 833 Panzeter, P.L., Zweifel, B. and Althaus, F.R.: Fast protein liquid chromatographic purification of poly(ADP-ribose) polymerase and separation of ADP-ribose polymers. *J. Chromatogr. A*, 678 (1994) 35-40.
- 834 Porcelli, B., Pagani, R., Lorenzini, L., de Martino, A., Catinella, S. and Traldi, P.: Different mass spectrometric approaches in the identification of endogenous methylated purine bases in urine extracts. *Rapid Commun. Mass Spectrom.*, 8 (1994) 443-450; *C.A.*, 121 (1994) 53339r.
- 835 Pulido-Cejudo, G., Gagnon, J., Leclerc, J.-M., Jamison, K., Gordon, J. and Campione-Piccardo, J.: Measurement of nucleoside diphosphate kinase-Nm23 activity by anion-exchange high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 37-47.
- 836 Seymour, K.K., Lyons, S.D., Phillips, L., Rieckmann, K.H. and Christoperson, R.I.: Cytotoxic effects of inhibitors of *de novo* pyrimidine biosynthesis upon *Plasmodium falciparum*. *Biochemistry*, 33 (1994) 5268-5274.
- 837 Sun, Y., Palasingam, K. and Nicholson, W.L.: High-pressure liquid chromatography assay for quantitatively monitoring spore photoproduct repair mediated by spore photoproduct lyase during germination of UV-irradiated *Bacillus subtilis* spores. *Anal. Biochem.*, 221 (1994) 61-65.
- 838 Takeda, N., Nakamura, M., Yoshizumi, H. and Tatematsu, A.: Detection of ribose-methylated nucleotides in *Pyrodictium occultum* tRNA by liquid chromatography - frit-fast atom bombardment mass spectrometry. *J. Chromatogr. B*, 660 (1994) 223-233.
- 839 Takeda, N., Nakamura, M., Yoshizumi, H. and Tatematsu, A.: Structural characterization of modified nucleosides in tRNA hydrolyzates by frit-fast atom bombardment liquid chromatography/mass spectrometry. *Biol. Mass Spectrom.*, 23 (1994) 465-474; *C.A.*, 121 (1994) 174267z.
- 840 Van Schepdael, A., Heerinckx, F., van Aerschot, A., Herdewijn, P., Roets, E. and Hoogmartens, J.: Comparative liquid chromatographic stability study of thymidine and 1-(2-deoxy- α -D-erythro-pentofuranosyl)thymine. *Nucleosides Nucleotides*, 13 (1994) 1113-1123; *C.A.*, 121 (1994) 109557e.
- 841 Ysart, G.E. and Mason, R.M.: Serum factors, growth factors and UDP-sugar metabolism in bovine articular cartilage chondrocytes. *Biochem. J.*, 303 (1994) 713-721.

See also 65, 157, 176, 426, 882, 1092, 1166, 1243.

21b. Nucleic acids, RNA

- 842 Kanduc, D.: Fractionation of rat liver tRNA by reversed-phase high performance liquid chromatography: isolation of iso-tRNAs^{Pro}. *Prepar. Biochem.*, 2114 (1994) 167-174.
- 843 Kowalak, J.A., Dalluge, J.J., McCloskey, J.A. and Stetter, K.O.: The role of posttranscriptional modification in stabilization of transfer RNA from hyperthermophiles. *Biochemistry*, 33 (1994) 7869-7876.

- 844 Mesters, J.R., Vorstenbosch, E.L.H., de Boer, A.J. and Kraal, B.: Complete purification of tRNA, charged or modified with hydrophobic groups, by reversed-phase high-performance liquid chromatography on a C₈/C₁₈ column system. *J. Chromatogr. A*, 679 (1994) 93-98.

See also 104.

21c. Nucleic acids, DNA

- 845 Mischiati, C., Fiorentino, D., Feriotti, G., Bianchi, N. and Gambari, R.: A chromatographic procedure for fully automated isolation of DNA from human whole blood. *J. Biochem. Biophys. Methods*, 28 (1994) 185-193; *C.A.*, 121 (1994) 152444c.
- 846 Mitra, A. and Que, Q.: Ectopic expression of a viral adenine methyltransferase gene in tobacco. *Biochim. Biophys. Acta*, 1219 (1994) 244-249.
- 847 Nickoloff, J.A.: Sepharose spin column chromatography. A fast, nontoxic replacement for phenol/chloroform extraction/ethanol precipitation. *Mol. Biotechnol.*, 1 (1994) 105-108; *C.A.*, 121 (1994) 77547h.

For additional information see *C.A.*:

121 (1994) 103543a.

21e. Structural studies on DNA and DNA mapping

- 848 Bonn, G., Huber, C. and Oefner, P.: Separation of nucleic acid fragments with alkylated nonporous polymer beads. *PCT Int. Appl. WO 94 11,305* (Cl. C02F1/28), 26 May 1994, AT Appl. 92/2,285, 18 Nov. 1992; 30 pp.; *C.A.*, 121 (1994) 127045r.

See also 846.

21f. Complex mixtures of nucleic acids and their fragments

- 849 King, L.C., George, M., Gallagher, J.E. and Lewtas, J.: Separation of ³²P-postlabeled DNA adducts of polycyclic aromatic hydrocarbons and nitrated polycyclic aromatic hydrocarbons by HPLC. *Chem. Res. Toxicol.*, 7 (1994) 503-510; *C.A.*, 121 (1994) 51586v.

22. ALKALOIDS

- 850 Buech, U., Isenberg, E. and Buech, H.P.: HPLC assay for atropine in serum and protein solutions after *in vitro* addition of the tropane alkaloid. *Methods Find. Exp. Clin. Pharmacol.*, 16 (1994) 361-365; *C.A.*, 121 (1994) 194780q.
- 851 Burton, D.E., Powell, L.L. and Xi, X.: Reproducibility of the determination of caffeine in coffee by micellar electrokinetic capillary chromatography. *J. Microcolumn Sep.*, 6 (1994) 5-10; *C.A.*, 121 (1994) 132495s.
- 852 Cieri, U.R.: Determination of reserpine in tablets by liquid chromatography with fluorescence detection: revised procedure. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 758-760.
- 853 Gilar, M., Perlik, F. and Patzelova, V.: (Determination of caffeine by high-performance liquid chromatography). *Ceska Slov. Farm.*, 43 (1994) 78-80; *C.A.*, 121 (1994) 49515c.

- 854 Häberlein, H. and Tschiersch, K.-P.: Effects of surface structure of reversed phases on the separation of alkaloids by HPLC. *Pharmazie*, 49 (1994) 769-775.
- 855 Iwasa, K., Kondo, Y., Kamiguchi, M. and Takao, N.: An application of HPLC and LC/API-MS for identification of metabolites of protoberberine alkaloids in cell cultures of *Corydalis pallida* var. *tenuis*. *Planta Med.*, 60 (1994) 290-292; C.A., 121 (1994) 175153w.
- 856 Rasamussen, B.B., Nielsen, K.K. and Brosen, K.: Determination of theophylline metabolites in human liver microsomes by high-performance liquid chromatography. *Anal. Biochem.*, 222 (1994) 9-13.
- 857 Remberg, B., Krenn, L., Kopp, B., Buchbauer, G. and Nikiforov, A.: Principal component analysis (PCA) of opium alkaloid contents for origin determination. *Pharmazie*, 49 (1994) 766-768.
- 858 Volkov, S.K. and Grodnitskaya, E.I.: Application of high-performance liquid chromatography to the determination of vinblastine in *Catharanthus roseus*. *J. Chromatogr. B*, 660 (1994) 405-408.
- 859 Zahlsen, K. and Nilsen, O.G.: Nicotine in hair of smokers and non-smokers: sampling procedure and gas chromatographic/mass spectrometric analysis. *Pharmacol. Toxicol. (Copenhagen)*, 75 (1994) 143-149; C.A., 121 (1994) 198365f.

For additional information see C.A.:

- 121 (1994) 51650m, 98935y, 109335f, 141823z, 187391k, 194773q.

See also 1119, 1167, 1184, 1216.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

23a. Porphyrins and other pyrroles

- 860 Houston, T., Moore, M.R., McColl, K.E.L. and Fitzsimons, E.J.: Regulation of haem biosynthesis in normoblastic erythropoiesis: role of 5-aminolaevulinic acid synthase and ferrochelatase. *Biochim. Biophys. Acta*, 1201 (1994) 85-93.
- 861 Inoue, H., Yamashita, H., Furuya, K., Nonomura, Y., Yoshioka, N. and Li, S.: Determination of copper(II) chlorophyllin by reversed-phase high-performance liquid chromatography. *J. Chromatogr. A*, 679 (1994) 99-104.
- 862 Kondo, Y., Nagano, Y., Watanabe, S., Yoshihara, T. and Nakamura, T.: Isolation and purification of cell-killing components of hematoporphyrins. *Jpn Kokai Tokkyo Koho* JP 05,331,170 (93,331,170) (Cl. C07D487/22), 14 Dec. 1993, Appl. 92/166,877, 02 Jun. 1992; 8 p.; C.A., 121 (1994) 98848x.
- 863 Kumar, U., Dorsey, J.G., Caruso, J.A. and Evans, E.H.: Metalloporphyrin speciation by liquid chromatography and inductively coupled plasma-mass spectrometry. *J. Chromatogr. Sci.*, 32 (1994) 282-285.
- 864 Lubben, M. and Morand, K.: Novel prenylated hemes as cofactors of cytochrome oxidases. Archaea have modified hemes A and O. *J. Biol. Chem.*, 269 (1994) 21473-21479.
- 865 Mikšík, I., Holan, V. and Deyl, Z.: Quantification and variability of eggshell pigment content. *Comp. Biochem. Physiol. A*, 109 (1994) 769-772.

- 866 Sato, H., Ido, K. and Kimura, K.: Simultaneous separation and quantification of free and metal-chelated protoporphyrins in blood by three-dimensional HPLC. *Clin. Chem. (Washington)*, 40 (1994) 1239-1244.

See also 867.

23b. Bile pigments

- 867 Yamaguchi, T., Shioji, I., Sugimoto, A., Komoda, Y. and Nakajima, H.: Chemical structure of a new family of bile pigments from human urine. *J. Biochem. (Tokyo)*, 116 (1994) 298-303.

23c. Indole derivatives and plant hormones (gibberellins)

- 868 Agatsuma, S., Sekino, H., Nagoshi, T. and Watanabe, H.: Indoxyl-β-D-glucuronide, the primary emitter of low-level chemiluminescence in plasma of hemodialysis patients. *Clin. Chem. (Washington)*, 40 (1994) 1580-1586.

- 869 Gibis, M. and Fischer, A.: (HPLC method for the rapid determination of indole and skatol in the adipose tissue of swine). *Dtsch. Lebensm.-Rundsch.*, 89 (1993) 313-316; C.A., 121 (1994) 106762g.

See also 442, 821, 873.

23d. Pyridine derivatives

- 870 Josefsson, M., Carlsson, B. and Norlander, B.: Chiral ion-pair chromatographic separation of two dihydropyridines with camphorsulfonic acids on porous graphitic carbon. *J. Chromatogr. A*, 684 (1994) 23-27.

For additional information see C.A.:

- 121 (1994) 124478y.

See also 104.

23e. Other N-heterocyclic compounds

- 871 Abell, A.D., Erhard, K.F., Yen, H.K., Yamashita, D.S., Brandt, M., Mohammed, H., Levy, M.A. and Holt, D.A.: Preparative chiral HPLC separation of all possible stereoisomers of LY191704 and LY266111 and their *in vitro* inhibition of human types 1 and 2 steroid 5α-reductases. *Bioorg. Med. Chem. Lett.*, 4 (1994) 1365-1368; C.A., 121 (1994) 133926v.

- 872 Baruffini, A., Massolini, G. and Gandini, C.: High-performance liquid chromatographic determination of pyroglutamic acid in cosmetic preparations. *Farmaco*, 49 (1994) 219-220; C.A., 121 (1994) 42395e.

- 873 Mao, J., Pacheco, C.R., Traficante, D.D. and Rosen, W.: Analysis of neutral nitrogen compounds in diesel oil by direct injection high-performance liquid chromatography-mass spectrometry-ultraviolet spectrometry methods. *J. Chromatogr. A*, 684 (1994) 103-111.

- 874 Van Landuyt, K.G., Thienpont, L.M., de Leenheer, A.P. and Stöckl, D.: Determination of creatinine in human serum using isocratic HPLC with an aluminium oxide stationary phase. *J. Chromatogr. Sci.*, 32 (1994) 294-297.

- 875 Vianna-Rodrigues, S., Martins-Viana, L., Quiroga, J., Insuasty, B., Abonia, R. and Baumann, W.: Chromatographic and spectroscopic properties of regiosomers of some 1H-1,5-benzodiazepines. *J. Heterocycl. Chem.*, 31 (1994) 813-817; C.A., 121 (1994) 179043h.

See also 41, 976, 1225.

24. ORGANIC SULPHUR COMPOUNDS (INCL. GLUCOSINOLATES)

- 876 Bauer, L.N., Min, R.S., Savinova, I.A. and Plyusnin, A.N.: (Separation and concentration of sulphur-containing compounds based on complexation). In: Bol'shakov, G.F. (Editor), *Probl. Khim. Nefti, Nauka, Sib Otd, Novosibirsk*, 1992, pp. 34-39; C.A., 121 (1994) 112979z.
- 877 Futani, S., Ubuka, T. and Abe, T.: High-performance liquid chromatographic determination of hypotaurine and taurine after conversion to 4-dimethylaminoazobenzene-4'-sulfonyl derivatives and its application to the urine of cysteine-administered rats. *J. Chromatogr. B*, 660 (1994) 164-169.
- 878 Husain, S., Khalid, S., Nagaraj, V. and Rao, R.N.: Rapid determination of 2,5-diaminobenzene-1,4-disulfonic acid by reversed phase HPLC. *J. High Resolut. Chromatogr.*, 17 (1994) 561-562.
- 879 Masuoka, N., Yao, K., Kinuta, M., Ohta, J., Wakimoto, M. and Ubuka, T.: High-performance liquid chromatographic determination of taurine and hypotaurine using 3,5-dinitrobenzoyl chloride as derivatizing reagent. *J. Chromatogr. B*, 660 (1994) 31-35.
- 880 Roussel, C. and Favrou, A.: HPLC separation of the atropisomers of some substituted N-arylhiazoline-2-thiones with γ -cyclodextrin as a chiral mobile phase additive: size and lipophilicity effect of substituents. *J. Inclusion Phenom. Mol. Recognit. Chem.*, 16 (1993) 283-296; C.A., 121 (1994) 169292z.
- 881 Shimada, K. and Mitamura, K.: Derivatization of thiol-containing compounds. *J. Chromatogr. B*, 659 (1994) 227-241 - a review with 77 refs.

For additional information see C.A.:

121 (1994) 141838h, 169312f, 179709e.

See also 70, 337, 651.

25. ORGANIC PHOSPHORUS COMPOUNDS (INCL. SUGAR PHOSPHATES)

- 882 Alnatan, A. and Mitchelson, F.: A simple and rapid HPLC assay for quantitating cyclic AMP accumulation in intact cell preparations. *J. Pharmacol. Toxicol. Methods*, 31 (1994) 47-51; C.A., 121 (1994) 152442a.
- 883 Palmieri, M.J., Reynolds, R.A., Gibson, J.B., Berry, G.T. and Segal, S.: Concentration of white blood cell UDP-galactose and UDP-glucose determined by high performance liquid chromatography. *Enzyme Protein*, 47 (1994) 105-115; C.A., 121 (1994) 103323d.

- 884 Tarelli, E. and Wheeler, S.F.: Drying from phosphate-buffered solutions can result in the phosphorylation of primary and secondary alcohol groups in saccharides, hydroxylated amino acids, proteins and glycoproteins. *Anal. Biochem.*, 22 (1994) 196-201.

For additional information see C.A.:

121 (1994) 132475k, 179708d.

See also 356, 417, 469, 540, 550, 571, 625, 827, 915, 1202.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

26a. Organometallic compounds

- 885 Dean, J.R., Ebdon, L., Foulkes, M.E., Crews, H.M. and Massey, R.C.: Determination of the growth promoter 4-hydroxy-3-nitrophenylarsonic acid in chicken tissue by coupled high-performance liquid chromatography-inductively coupled plasma mass spectrometry. *J. Anal. At. Spectrom.*, 9 (1994) 615-618; C.A., 121 (1994) 106806z.
- 886 Farag, A.B., El-Shahawi, M.S. and Farrag, S.: The sorption behavior and separation of some metal thiocyanate complexes on polyether-based polyurethane foam. *Talanta*, 41 (1994) 617-623; C.A., 121 (1994) 98569g.
- 887 Shibata, Y., Yoshinaga, J. and Morita, M.: Detection of arsenobetaine in human blood. *Appl. Organomet. Chem.*, 8 (1994) 249-251; C.A., 121 (1994) 75470d.
- 888 Wilken, R.D., Kuballa, J. and Jantzen, E.: Organotins: their analysis and assessment in the Elbe river system, Northern Germany. *Fresenius J. Anal. Chem.*, 350 (1994) 77-84.

See also 459.

26b. Boranes, silanes and related non-metallic compounds

- 889 Harfst, S., Moller, D., Ketz, H., Rösler, J. and Gabel, D.: Reversed-phase separation of ionic organoborate clusters by high-performance liquid chromatography. *J. Chromatogr. A*, 678 (1994) 41-48.

See also 1136.

26c. Coordination compounds

- 890 Vrchlabsky, M., Janik, V. and Vespalet, R.: Chromatography of chromium(III) complexes with azo dyes. *Scr.-Chem.*, 22 (1992) 45-56; C.A., 121 (1994) 181916p.

For additional information see C.A.:

121 (1994) 30142g.

See also 199, 200, 876, 1284.

27. VITAMINS AND VARIOUS ANIMAL GROWTH FACTORS (NON-PEPTIDIC)
- 891 Achkar, C.C., Bentel, J.M., Boylan, J.F., Scher, H.I., Gudas, L.J. and Miller, W.H., Jr.: Differences in the pharmacokinetic properties of orally administered all-trans-retinoic acid and 9-cis-retinoic acid in the plasma of nude mice. *Drug Metab. Disp.*, 22 (1994) 451-458.
- 892 Aitzetmüller, K.: HPLC von Vitamin A - Estern in Margarine. *Fat Sci. Technol.*, 96 (1994) 279-285.
- 893 Aksnes, L.: Simultaneous determination of retinol, α -tocopherol, and 25-hydroxyvitamin D in human serum by high-performance liquid chromatography. *J. Pediatr. Gastroenterol. Nutr.*, 18 (1994) 339-343; C.A., 121 (1994) 152441z.
- 894 Anes, J.M., Beck, R.A., Brink, J.J. and Goldberg, R.J.: Nitritocobalamin and nitrosocobalamin may be confused with sulfitocobalamin using cation-exchange chromatography. *J. Chromatogr. B*, 660 (1994) 180-185.
- 895 Behrens, W.A. and Madere, R.: A procedure for the separation and quantitative analysis of ascorbic acid, dehydroascorbic acid, isoascorbic acid, and dehydroisoascorbic acid in food and animal tissue. *J. Liq. Chromatogr.*, 17 (1994) 2445-2455.
- 896 Besler, K., Knecht, U. and Nöll, G.N.: Replacement of toxic mobile phases commonly used in high performance liquid chromatography of retinoids. *Fresenius J. Anal. Chem.*, 350 (1994) 182-184.
- 897 Biacs, P.A. and Daood, H.G.: High-performance liquid chromatography with photodiode-array detection of carotenoids and carotenoid esters in fruits and vegetables. *J. Plant Physiol.*, 143 (1994) 520-525; C.A., 121 (1994) 81220p.
- 898 Blanco Gomis, D., Escotet Arias, V.J., Fidalgo Alvarez, L.E. and Gutiérrez Alvarez, M.D.: Simultaneous determination of vitamins D₃, E and K₁ and retinyl palmitate in cattle plasma by liquid chromatography with a narrow-bore column. *J. Chromatogr. B*, 660 (1994) 49-55.
- 899 Blau, N., Kierat, L., Matasovic, A., Leimbacher, W., Heizmann, C.W., Guardamagna, O. and Ponzone, A.: Antenatal diagnosis of tetrahydrobiopterin deficiency by quantification of pterins in amniotic fluid and enzyme activity in fetal and extrafetal tissue. *Clin. Chim. Acta*, 226 (1994) 159-169.
- 900 Carpenter, D.R., Hammerstone, J.F., Jr., Romanczyk, L.J., Jr. and Aitken, W.M.: Lipid composition of *Herrania* and *Theobroma* seeds. *J. Am. Oil Chem. Soc.*, 71 (1994) 845-851.
- 901 Chase, G.W., Jr., Akoh, C.C. and Eitenmiller, R.R.: Analysis of tocopherols in vegetable oils by high-performance liquid chromatography: comparison of fluorescence and evaporative light-scattering detection. *J. Am. Oil Chem. Soc.*, 71 (1994) 877-880.
- 902 Dutta, P.C., Helmersson, S., Kebedu, E., Aleman, G. and Appelquist, L.-A.: Variation of lipid composition of niger seed (*Guizotia abyssinica* Cass.) samples from different regions in Ethiopia. *J. Am. Oil Chem. Soc.*, 71 (1994) 839-843.
- 903 Gonzalez-Corbella, M.J., Lloberas-Blanch, N., Castellote-Bargallo, A.I., Lopez-Sabater, M.C. and Rivero-Urgell, M.: Determination of α -tocopherol in plasma and erythrocytes by high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 395-400.
- 904 Hagar, A.F., Madsen, L., Wales, L., Jr. and Bradford, H.B., Jr.: Reversed-phase liquid chromatographic determination of vitamin D in milk. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 1047-1051.
- 905 Ifuku, O., Koga, N., Haze, S.-i., Kishimoto, J. and Wachi, Y.: Flavodoxin is required for conversion of dehydrobiotin to biotin in *Escherichia coli*. *Eur. J. Biochem.*, 224 (1994) 173-178.
- 906 Kirchhoeffer, R.D.: Niacin II: identification of isonicotinic acid in niacin by liquid chromatography with diode array detection. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 587-590.
- 907 Kobayashi, N. and Shimada, K.: (Development of analysis method for vitamin D metabolite). *Farumashia*, 30 (1994) 864-868; C.A., 121 (1994) 174179x - a review with 17 refs.
- 908 Marchetti, M.N., Bun, H., Geiger, J.M. and Durand, A.: Determination of a new retinoid: 9-cis retinoic acid in plasma by HPLC. *Anal. Lett.*, 27 (1994) 1847-1862.
- 909 McDiarmid, R.E., Majak, W. and Cheng, K.J.: Procedure for analysis of α -tocopherol acetate in bovine ruminal fluid. *Can. J. Anim. Sci.*, 74 (1994) 391-392; C.A., 121 (1994) 199928d.
- 910 Morita, K., Fukuzawa, Y., Kodaka, K. and Ujiie, T.: (A simple method for determination of vitamin D in foods by ethyl acetate/n-hexane extraction-high performance liquid chromatography). *Bitamin*, 68 (1994) 303-307; C.A., 121 (1994) 156027s.
- 911 Mueller, H.: (Determination of the folic acid content of grain, cereal products, bakery products, and legumes by HPLC). *Z. Lebensm.-Unters. Forsch.*, 197 (1993) 573-577; C.A., 121 (1994) 203613s.
- 912 Pfander, H., Riesen, R. and Niggli, U.: HPLC and SFC of carotenoids - scope and limitations. *Pure Appl. Chem.*, 66 (1994) 947-954; C.A., 121 (1994) 77516x - a review with 36 refs.
- 913 Richheimer, S.L., Kent, M.C. and Bernart, M.W.: Reversed-phase high-performance liquid chromatographic method using a pentfluorophenyl bonded phase for analysis of tocopherols. *J. Chromatogr. A*, 677 (1994) 75-80.
- 914 Shin, T.-S. and Godber, J.S.: Isolation of four tocopherols and four tocotrienols from a variety of natural sources by semi-preparative high-performance liquid chromatography. *J. Chromatogr. A*, 678 (1994) 49-58.
- 915 Tsujii, M., Kuroda, H., Furusawa, Y. and Hirota, K.: Column chromatography for purification of crude products, including lecithin and vitamin K. *Eur. Pat. Appl. EP 592,962 (Cl. B01D15/08)*, 20 Apr. 1994, JP Appl. 92/300,560, 14 Oct. 1992, 7 p.; C.A., 121 (1994) 38599g.
- 916 Ul'yanova, S.V., Shchavinskii, A.N., Morev, S.N., Dimitrenko, T.S. and Finkel'shtein, E.I.: (HPLC analysis of water-soluble vitamins B₁, B₂, B₆, C and nicotinamide in the Hexavit tablets). *Farmatsiya (Moscow)*, 42 (1993) 50-51; C.A., 121 (1994) 141849n.
- 917 Wang, X.-D., Krinsky, N.I., Benotti, P.N. and Russel, R.M.: Biosynthesis of 9-cis-retinoic acid from 9-cis- β -carotene in human intestinal mucosa *in vitro*. *Arch. Biochem. Biophys.*, 313 (1994) 150-155.
- 918 Wei, S., Tanaka, H., Kubo, T., Ichikawa, M. and Seino, Y.: A multiple assay for vitamin D metabolites without high-performance liquid chromatography. *Anal. Biochem.*, 222 (1994) 359-365.

- 919 Wilberg, V.C. and Rodriguez-Amaya, D.B.: (Quantification by high-efficiency liquid chromatography of β -carotene and lycopene in tomatoes and some tomato products). *Cienc. Tecnol. Aliment.*, 13 (1993) 132-141; C.A., 121 (1994) 81205n.
- 920 Zalewski, S.: Effect of cooking methods on vitamin C, nitrates and nitrites contents and sensory quality in Brussels sprouts. *Pol. J. Food Nutr. Sci.*, 2 (1993) 85-92; C.A., 121 (1994) 106971z.
- 921 Zhiri, A. and Belichard, P.: Reversed-phase liquid chromatographic analysis of coenzyme Q10 and stability study in human plasma. *J. Liq. Chromatogr.*, 17 (1994) 2633-2640.
- For additional information see C.A.:
121 (1994) 106766m, 187452f, 199907w.
- See also 240, 1005, 1204.
28. ANTIBIOTICS
- 922 Allan, L., Cummings, J., Willmott, N., Whateley, T.L. and Smyth, J.F.: Incorporation and release of chemically intact mitomycin C from albumin microspheres: a high-performance liquid chromatography evaluation. *J. Drug Targeting*, 1 (1993) 317-323; C.A., 121 (1994) 91643t.
- 923 Bayo, J., Moreno, M.A., Prieta, J., Diaz, S., Suarez, G. and Dominguez, L.: Chloramphenicol extraction from milk by using the diphasic dialysis method followed by liquid chromatographic determination. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 854-856.
- 924 Blanchflower, W.J., Cannavan, A., McCracken, R.J., Hewitt, S.A. and Kennedy, D.G.: Determination of chloramphenicol in plasma, milk and tissue using liquid chromatography/thermospray mass spectrometry. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 1, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 196-200; C.A., 121 (1994) 132499w.
- 925 Blanchflower, W.J., McCracken, R.J. and Kennedy, D.G.: Detection of furazolidone in muscle using liquid chromatography/thermospray mass spectrometry. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 1, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 201-205; C.A., 121 (1994) 156005h.
- 926 Blows, W.M., Foster, G., Lane, S.J., Noble, D., Piercy, J.E., Sidebottom, P.J. and Webb, G.: The squalenestatins, novel inhibitors of squalene synthase produced by a species of *Phoma*. V. Minor metabolites. *J. Antibiot.*, 47 (1994) 740-754.
- 927 Boison, J.O.K., Keng, L.J.-Y. and MacNeil, J.D.: Analysis of penicillin G in milk by liquid chromatography. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 565-570.
- 928 Bonfichi, R.: Computer-assisted rapid development of gradient high-performance liquid chromatographic methods for the analysis of antibiotics. *J. Chromatogr. A*, 678 (1994) 213-221.
- 929 Bryan, P.D.: Part I. Use of post-column reactions with luminescence detection for the HPLC analysis of drugs. Part II. HPLC analysis of tetracyclines using polymeric columns with acidic mobile phases. Avail. *Univ. Microfilms Int.*, Order No. DA9404635, 1993, 138 p.; C.A., 121 (1994) 117853p.
- 930 Bryan, P.D. and Stewart, J.T.: Chromatographic analysis of selected tetracyclines from dosage forms and bulk drug substance using polymeric columns with acidic mobile phases. *J. Pharm. Biomed. Anal.*, 12 (1994) 675-692.
- 931 Buchan, T., Roach, C., Ruby, C., Taylor, D., Preisig, C. and Reeves, C.: Mutants of *Streptomyces cattleya* defective in the synthesis of a factor required for thienamycin production. *J. Antibiot.*, 47 (1994) 992-1000.
- 932 Chan, W. and Salisbury, C.D.C.: Determination of penicillin G residues in eggs. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 1, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 236-237; C.A., 121 (1994) 156008m.
- 933 Chan, W. and Salisbury, C.D.C.: Determination of tetracycline antibiotics in eggs. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 238-240; C.A., 121 (1994) 156009n.
- 934 Charles, B.G., Foo, C.C. and Gath, J.: Rapid column liquid chromatographic analysis of flucloxacillin in plasma on a microparticulate pre-column. *J. Chromatogr. B*, 660 (1994) 186-190.
- 935 Cravedi, J.P., Baradat, M., Debrauwer, L., Alary, J., Tulliez, J.: Evidence for new metabolic pathways of chloramphenicol in the duck. *Drug Metab. Disp.*, 22 (1994) 578-583.
- 936 Demotes-Mainard, F., Labat, L., Vincon, G. and Bannwarth, B.: Column-switching high-performance liquid-chromatographic determination of vancomycin in serum. *Ther. Drug Monit.*, 16 (1994) 293-297; C.A., 121 (1994) 169546k.
- 937 Ericson, J.F., Calcagni, A. and Lynch, M.J.: Determination of semduramycin sodium in poultry liver by liquid chromatography with vanillin postcolumn derivatization. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 577-582.
- 938 Friedrich, L.V., White, R.L., Kays, M.B. and Burgess, D.S.: Drug degradation during HPLC analysis of aztreonam: effect on pharmacokinetic parameter estimation. *Ann. Pharmacother.*, 28 (1994) 444-446; C.A., 121 (1994) 98939c.
- 939 Gerhardt, G.C., Salisbury, C.D.C. and McNeil, J.D.: Analysis of streptomycin and dihydrostreptomycin milk by liquid chromatography. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 765-767.
- 940 Gooden, W.E., Du, Y., Ahluwalia, R. and Day, R.A.: The separation of biologically active diastereomers of zwitterionic β -lactams by anion exchange chromatography. *Anal. Lett.*, 27 (1994) 2153-2169.
- 941 Haagsma, N. and Scherpenisse, P.: High-performance liquid chromatographic determination of tetracyclines in animal tissue and eggs. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 342-346; C.A., 121 (1994) 156011g.
- 942 Hattori, H., Suzuki, O., Seno, H., Ishii, A. and Yamada, T.: Analyses of quinolone antimicrobials in human plasma by capillary high-performance liquid chromatography/fast atom bombardment mass spectrometry. *Hochudoku*, 11 (1993) 166-175; C.A., 121 (1994) 26124k.
- 943 Hormazábal, V. and Yndestad, M.: A rapid and time-effective assay for determination of oxolinic acid and flumequine in fish tissues by HPLC. *J. Liq. Chromatogr.*, 17 (1994) 2911-2917.
- 944 Hormazábal, V. and Yndestad, M.: Simultaneous extraction and determination of oxolinic acid and flumequine in fish silage by HPLC. *J. Liq. Chromatogr.*, 17 (1994) 2901-2909.

- 945 Hornish, R.E. and Cazers, A.R.: Determinative and confirmatory analysis for pirlimycin residue in bovine milk and liver by thermospray HPLC/MS. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 382-386; C.A., 121 (1994) 132502s.
- 946 Kamiyama, T., Umino, T., Nakamura, Y., Itezono, Y., Sawari, S., Satoh, T. and Yokose, K.: Bacithrocins A, B and C, novel thrombin inhibitors. *J. Antibiot.*, 47 (1994) 959-968.
- 947 Kikuchi, Y., Kitazaki, T., Saito, H., Shibanuma, T., Morozumi, N., Kanai, Y., Yonemoto, Y., Sugita, O. and Ohnuma, N.: (Microbiological assay method for SY5555, a new oral penem, in biological fluids). *Cancer Chemotherapy (Tokyo)*, 42(Suppl. 1) (1994) 227-234; C.A., 121 (1994) 49520a.
- 948 Kobayashi, Y., Miyazaki, H., Shiozaki, M. and Haruyama, H.: Synthesis of 5-epi-trehazolin (trehalostatin). *J. Antibiot.*, 47 (1994) 932-938.
- 949 Koiso, Y., Li, Y., Iwasaki, S., Hanaoka, K., Kobayashi, T., Sonoda, R., Fujita, Y., Yaegashi, H. and Sato, Z.: Ustiloxins, antimytotic cyclic peptides from false smut balls on rice panicles caused by *Ustilagoidea virens*. *J. Antibiot.*, 47 (1994) 765-773.
- 950 Kuschel, A., Anke, T., Velten, R., Klostermeyer, D., Steglich, W. and König, B.: The mniopetals, new inhibitors of reverse transcriptase from a *Mniopetalum* species (Basidiomycetes). I. Producing organism, formation, isolation and biological activities. *J. Antibiot.*, 47 (1994) 733-739.
- 951 Lim, J.M., Kim, H., Marco, A., Mojaverian, P. and Lin, C.-C.: Liquid chromatographic determination of ceftibuten, a new oral cephalosporin, in human plasma and urine. *J. Pharm. Biomed. Anal.*, 12 (1994) 699-703.
- 952 Lin, Q.: (Effect of pH value of mobile phase on the retention behavior of *Mydecamycin* in high performance liquid chromatography). *Sepu*, 12 (1994) 150-151; C.A., 121 (1994) 53277u.
- 953 Maniara, W.M. and Powell, M.L.: Determination of the rifamycin-related hypolipidemic drug CGP 43371 in human feces, plasma and urine by high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 135-142.
- 954 Meinertz, J.R., Dawson, V.K., Gingerich, W.H., Chebg, B. and Tubergen, M.M.: Liquid chromatographic determination of sarafloxacin residues in channel catfish muscle tissue. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 871-875.
- 955 Moats, W.A., Anderson, K.L., Rushing, J.E. and Wesen, D.P.: Comparison of the Charm II test and an HPLC method for detection of oxytetracycline in milk. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 495-498; C.A., 121 (1994) 156019r.
- 956 Moore, W.N. and Taylor, L.T.: Analytical inverse supercritical fluid extraction of polar pharmaceutical compounds from cream and ointment matrices. *J. Pharm. Biomed. Anal.*, 12 (1994) 1227-1232.
- 957 Morishita, A., Ishikawa, S., Ito, Y., Ogawa, K., Takada, M., Yaginuma, S. and Yamamoto, S.: AM4299A and B, novel thiol protease inhibitors. *J. Antibiot.*, 47 (1994) 1065-1068.
- 958 Morovjan, G., Horvath, E., Vagi, I. and Fekete, J.: Determination of oxytetracycline and its decomposition products in Tetran pulmonary powder. *Acta Pharm. Hung.*, 64 (1994) 67-73; C.A., 121 (1994) 91978f.
- 959 Morris, S.A., Schwartz, R.E., Sesin, D.F., Masurekar, P., Hallada, T.C., Schmatz, D.M., Bartizal, K., Hensens, O.D. and Zink, D.L.: Pneumocandin D₀, a new antifungal agent and potent inhibitor of *Pneumocystis carinii*. *J. Antibiot.*, 47 (1994) 755-764.
- 960 Nakanishi, S., Kita, K., Uosaki, Y., Yoshida, M., Saitoh, Y., Mi-hara, A., Kawamoto, I. and Matsuda, Y.: MS-282a and MS-282b, new inhibitors of calmodulin-activated myosin light chain kinase from *Streptomyces tauricus* ATCC 27470. *J. Antibiot.*, 47 (1994) 855-861.
- 961 Oka, H., Ikai, Y., Hayakawa, J., Masuda, K., Harada, K.-I. and Suzuki, M.: Improvement of chemical analysis of antibiotics. Part XIX: determination of tetracycline antibiotics in milk by liquid chromatography and thin-layer chromatography/fast atom bombardment mass spectrometry. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 891-895.
- 962 Porter, S.: The confirmation of tetracycline residues in kidney by thermospray liquid chromatography-mass spectrometry. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 533-537; C.A., 121 (1994) 203621t.
- 963 Pouliquen, H., le Bris, H., Keita, D. and Pinault, L.: Determination of oxytetracycline in shellfish (*Crassostrea gigas*, *Ruditapes philippinarum* and *Scrobicularia plana*) by high-performance liquid chromatography-application to an experimental study performed in shellfish exposed to a seawater effluent containing oxytetracycline. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 553-557; C.A., 121 (1994) 132604b.
- 964 Priston, M.J. and Sewell, G.J.: Improved LC assay for the determination of mitozantrone in plasma: analytical considerations. *J. Pharm. Biomed. Anal.*, 12 (1994) 1153-1162.
- 965 Rodewald, J.M., Moran, T.D., Donoho, A.L. and Coleman, M.R.: Determination of narasin in raw material, premix, and animal feeds by liquid chromatography and correlation to microbial assay. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 821-828.
- 966 Roudaut, B. and Garnier, M.: Rapid determination of oxytetracycline in milk by high performance liquid chromatography. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 596-600; C.A., 121 (1994) 177971k.
- 967 Sanders, P. and Delepine, B.: Confirmatory analysis for spiramycin residue in bovine muscle by liquid chromatography/particle beam mass spectrometry. *Biol. Mass Spectrom.*, 23 (1994) 369-375; C.A., 121 (1994) 56086s.
- 968 Szanya, T., Hanak, L., Strbka, G., Nagy, E., Melczer, I., Deak, G., Mako, B., Karczub, A., Marton, G., et al.: Process for the purification of cyclosporin A. *Can. Pat. Appl. CA 2,096,892 (Cl. C07K/64)*, 26 Nov. 1993, HU Appl. 92/9,201,728, 25 May 1992; 23 pp.; C.A., 121 (1994) 177850v.
- 969 Tsukamoto, T. and Ushio, T.: Determination of (2S, 3S, 5R)-3-methyl-7-oxo-3-(1H-1,2,3-triazol-1-ylmethyl)-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid 4,4-dioxide (YTR-83OH) and piperacillin in pharmaceutical preparations by high-performance liquid chromatography. *J. Chromatogr. A*, 678 (1994) 69-76.

- 970 Tyczkowska, K.L., Voyksner, R.D., Anderson, K.L. and Papich, M.G.: Simultaneous determination of enrofloxacin and its primary metabolite ciprofloxacin in bovine milk and plasma by ion-pairing liquid chromatography. *J. Chromatogr. B*, 658 (1994) 341-348.
- 971 Wiese, B. and Horn af Rantzen, M.: Improved sensitive and selective bioanal. HPLC method for the determination of benzylpenicillin in milk and other body fluids at concentrations \geq 4 ng/ml. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 680-684; C.A., 121 (1994) 203628a.
- 972 Wong, S.H.Y., Ghodgaonkar, B., Fong, P., Campbell, B., Burdick, J.F. and Boctor, F.: Supercritical fluid chromatography for therapeutic drug monitoring of immunosuppressants: selectivity for cyclosporine A, FK 506 (Tacrolimus), and rapamycin. *J. Liq. Chromatogr.*, 17 (1994) 2093-2109.
- 973 Yongxin, Z., Hendrix, C., Busson, R., Janssen, G., Roets, E. and Hoogmartens, J.: Isolation and structural elucidation of an impurity of cefradine. *J. Pharm. Biomed. Anal.*, 12 (1994) 1137-1140.
- 974 Yoshida, K. and Kondo, F.: Procedure for liquid chromatographic determination of thiamphenicol in bovine serum and milk. *J. Liq. Chromatogr.*, 17 (1994) 2625-2632.
- For additional information see C.A.:
121 (1994) 49514b, 117854q, 164087b.
- See also 165, 1177, 1206.
29. INSECTICIDES, PESTICIDES AND OTHER AGROCHEMICALS
- 29a. General techniques
- 975 Barceló, D., Chiron, S., Lacorte, S., Martínez, E., Salau, J.S. and Hennion, M.C.: Solid-phase sample preparation and stability of pesticides in water using Empore disks. *TrAC*, 13 (1994) 352-361.
- 976 Ellerbroek, L.: Microbial and chemical detection methods for residues of quinolones and related substances in animal tissue. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 280-284; C.A., 121 (1994) 156010f.
- 977 Fischer, J. and Jandera, P.: Chromatographic behaviour of phenylurea pesticides in high-performance liquid chromatography with nitrile- and amino-bonded stationary phases. *J. Chromatogr. A*, 684 (1994) 77-92.
- 978 Furuta, R. and Doi, T.: Chiral separation of diniconazole, uniconazole and structurally related compounds by cyclodextrin-modified micellar electrokinetic chromatography. *Electrophoresis (Weinheim)*, 15 (1994) 1322-1325.
- 979 Hogendoorn, E.A. and van Zoonen, P.: Coupled-column reversed phase liquid chromatography as a versatile technique for the determination of polar pesticides. *Tech. Instrum. Anal. Chem.*, 13(Environmental Analysis) (1993) 181-224; C.A., 121 (1994) 29096p.
- 980 Jimena Garcia, J.A., Giménez Plaza, J. and Cano Pavón, J.M.: Determination of fenitrothion, tetramethrin, dichlorvos, permethrin and piperonyl butoxide in insecticide formulations by liquid chromatography. *Quím. Anal. (Barcelona)*, 12 (1993) 35-37; C.A., 121 (1994) 151168d.
- 981 McGarvey, B.D.: Derivatization reactions applicable to pesticide determination by high-performance liquid chromatography. *J. Chromatogr. B*, 659 (1994) 243-257 - a review with 113 refs.
- 982 Schütz, S., Hummel, H.E., Duhr, A. and Wollnik, H.: Structural elucidation and trace analysis with combined hyphenated chromatographic and mass spectrometric methods. Potential of using hybrid sector mass spectrometry-time-of-flight mass spectrometry for pesticide analysis. *J. Chromatogr. A*, 683 (1994) 141-149.
- For additional information see C.A.:
121 (1994) 52239w, 81189k.
- See also 77, 108, 155, 1239, 1241.
- 29c. Phosphorus insecticides
- 983 Loukas, Y.L., Antoniadou-Vyza, E. and Papadaki-Valiraki, A.: High-performance liquid chromatography in stability studies of an organophosphorus insecticide in free form and after formulation as emulsifiable concentrate. Response surface design correlation of kinetic data and parameters. *J. Chromatogr. A*, 677 (1994) 53-61.
- 984 Murakita, H., Hamada, N. and Yagi, T.: (Determination of glyphosate by HPLC). *Kuromatografi*, 14 (1993) 12-13; C.A., 121 (1994) 56074m.
- 985 Sancho, J.V., López, F.J., Hernández, F., Hogendoorn, E.A. and van Zoonen, P.: Rapid determination of glufosinate in environmental water samples using 9-fluorenylmethoxycarbonyl precolumn derivatization, large-volume injection and coupled-column liquid chromatography. *J. Chromatogr. A*, 678 (1994) 59-67.
- 29e. Herbicides
- 986 Butz, S., Heberer, T. and Stan, H.-J.: Determination of phenoxy-alkanoic acids and other acidic herbicides at the low ppt level in water applying solid-phase extraction with RP-C₁₈ material. *J. Chromatogr. A*, 677 (1994) 63-74.
- 987 Färber, H., Nick, K. and Schöler, H.F.: Determination of hydroxy-S-triazines in water using HPLC or GC-MS. *Fresenius J. Anal. Chem.*, 350 (1994) 145-149.
- 988 Fogarty, A.M., Traina, S.J. and Tuovinen, O.H.: Determination of dicamba by reverse-phase HPLC. *J. Liq. Chromatogr.*, 17 (1994) 2667-2674.
- 989 Willian, W.T. and Mueller, T.C.: Liquid chromatographic determination of norflurazon and its initial metabolite in soil. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 752-755.
- See also 977, 1177.
- 29f. Fungicides
- 990 Rietveld, R. and Quirijns, J.: On-line liquid chromatography-gas chromatography for determination of fenarimol in fruiting vegetables. *J. Chromatogr. A*, 683 (1994) 151-155.

29g. Other types of pesticides and various agrochemicals

- 991 Gray, A., Eadsforth, C.V., Dutton, A.J. and Vaughan, J.A.: Non-invasive method for monitoring the exposure of barn owls to second-generation rodenticides. *Pestic. Sci.*, 41 (1994) 339-343; C.A., 121 (1994) 197753u.
- 992 Kondo, F., Hamada, E., Tsai, C.-E., Lin, S.-Y., Tateyama, S. and Saitanu, K.: A reverse-phase high-performance liquid chromatographic determination of nicarbazin residues in eggs. *Cytobios*, 76 (1993) 175-182; C.A., 121 (1994) 56067m.
- 993 Koppen, B.: Liquid chromatographic determination of pyrethroids as active ingredients in pesticide formulations. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 810-814.
- 994 Lu, Z., Liu, Y., Xu, W. and Tian, C.: (Reversed-phase high performance liquid chromatographic determination of quinclorac). *Sepu*, 12 (1994) 217-218; C.A., 121 (1994) 151171z.
- 995 Stepanovic, R.D., Howell, C. and Hedin, P.A.: Biosynthesis of glovirin: incorporation of L-phenylalanine (1^{-13}C). *J. Antibiot.*, 47 (1994) 942-944.

30. SYNTHETIC AND NATURAL DYES

30a. Synthetic dyes

- 996 Allen, J.L., Gofus, J.E. and Meinertz, J.R.: Determination of malachite green residues in the eggs, fry, and adult muscle tissue of rainbow trout (*Oncorhynchus mykiss*). *J. Assoc. Off. Anal. Chem.*, 77 (1994) 553-557.
- 997 Andrisano, V., Gotti, R., di Pietra, A.M. and Cavrini, V.: HPLC analysis of oxidation hair dyes in permanent hair colorants. *J. Liq. Chromatogr.*, 17 (1994) 2919-2937.
- 998 Andrisano, V., Gotti, R., DiPietra, A.M. and Cavrini, V.: Analysis of basic hair dyes by HPLC with on-line post-column photochemical derivatisation. *Chromatographia*, 39 (1994) 138-145.
- 999 Kopecky, J., Kajan, M. and Tichy, V.: (Analysis of alimentary dyes from fresh-water algae by HPLC method). *Kvasny Prum.*, 39 (1993) 102-106; C.A., 121 (1994) 199913v.
- 1000 Weisz, A., Andrzejewski, D. and Ito, Y.: Preparative separation of components of the color additive D&C Red No. 28 (phloxine B) by pH-zone-refining counter-current chromatography. *J. Chromatogr. A*, 678 (1994) 77-84.

30b. Chloroplast and other natural pigments

- 1001 Bento, L.S.M.: Separation of sugar colorants through sucrose chromatography. *Int. Sugar J.*, 95 (1993) 391-396; C.A., 121 (1994) 37956j.
- 1002 Chen, T.M. and Chen, B.H.: Optimization of mobile phases for HPLC of *cis-trans* carotene isomers. *Chromatographia*, 39 (1994) 346-354.
- 1003 Lalitha, N.: Chromatographic separation of plant pigments using sand as the adsorbent: an inexpensive chromatographic technique. *J. Chem. Educ.*, 71 (1994) 432; C.A., 121 (1994) 34369j.
- 1004 Millie, D.F., Paerl, H.W. and Hurley, J.P.: Microalgal pigment assessments using high-performance liquid chromatography: a synopsis of organismal and ecological applications. *Can. J. Fish. Aquat. Sci.*, 50 (1993) 2513-2527; C.A., 121 (1994) 30086s.

- 1005 Papadopoulou, K. and Ames, J.M.: Kinetics of all *trans*- β -carotene degradation on heating with and without phenylalanine. *J. Am. Oil Chem. Soc.*, 71 (1994) 893-896.
- 1006 Simpson, K.I., Guimaraes, I.S. and Wilberg, V.C.: Isolation and purification of bixin on a C-18 reverse phase column. *Cienc. Tecnol. Aliment.*, 13 (1993) 164-167; C.A., 121 (1994) 103310x.
- 1007 Suzuki, R., Takahashi, M., Furuya, K. and Ishimaru, T.: Simplified technique for the rapid determination of phytoplankton pigments by reverse-phase high-performance liquid chromatography. *J. Oceanogr.*, 49 (1993) 571-580; C.A., 121 (1994) 174261t.
- 1008 Szajdak, L.: (Chromatographic studies of humic acids). *Zesz. Probl. Postepow Nauk Roln.*, 411 (1993) 229-240; C.A., 121 (1994) 132982y.
- 1009 Val, J., Monge, E. and Baker, N.R.: An improved HPLC method for rapid analysis of the xanthophyll cycle pigments. *J. Chromatogr. Sci.*, 32 (1994) 286-289.
- 1010 Ward, K., Scarth, R., Duan, J.K. and Thorsteinson, C.T.: A comparison of high-performance liquid chromatography and spectrophotometry to measure chlorophyll in canola seed and oil. *J. Am. Oil Chem. Soc.*, 71 (1994) 931-934.
- 1011 Ward, K., Scarth, R., Duan, J.K. and Thorsteinson, C.T.: Effects of processing and storage on chlorophyll derivatives in commercially extracted canola oil. *J. Am. Oil Chem. Soc.*, 71 (1994) 811-815.

For additional information see C.A.:

121 (1994) 117302h.

See also 15, 897, 912, 919.

31. PLASTICS AND THEIR INTERMEDIATES

- 1012 Berek, D., Janco, M., Kitayama, T. and Hatada, K.: Separation of poly(methyl methacrylates) according to their tacticity. 1. Preliminary studies on the tacticity dependence of chromatographic behavior of stereoregular PMMAs. *Polym. Bull. (Berlin)*, 32 (1994) 629-635; C.A., 121 (1994) 110068c.
- 1013 Campos, A., Garcia, R., Porcar, I. and Soria, V.: Solution properties of polyelectrolytes. XI. Adsorption effects in aqueous size-exclusion chromatography of polyanions. *J. Liq. Chromatogr.*, 17 (1994) 3261-3283.
- 1014 Chang, T.T.: Characterization of methoxymethyl melamine resins by liquid chromatography/mass spectrometry. *Anal. Chem.*, 66 (1994) 3267-3273.
- 1015 Cools, P.J.C.H., van Herk, A.M., German, A.L. and Staal, W.: Critical retention behavior of homopolymers. *J. Liq. Chromatogr.*, 17 (1994) 3133-3143.
- 1016 Eleveld, J.T., Claessens, H.A., Ammerdorffer, J.L., van Herk, A.M. and Cramers, C.A.: Evaluation of mixed-mode stationary phases in liquid chromatography for the separation of charged and uncharged oligomer-like model compounds. *J. Chromatogr. A*, 677 (1994) 211-227.

- 1017 Glöckner, G., Wolf, D. and Engelhardt, H.: Control of adsorption and solubility in gradient high performance liquid chromatography. Part 4. Sudden-transition gradient elution of styrene/ethyl methacrylate copolymers in reverse phase mode. *Chromatographia*, 39 (1994) 170-174.
- 1018 Huguenard, C., Elaissari, A. and Pefferkorn, E.: Surface area exclusion chromatography of diblock copolymers from micellar solutions. *Macromolecules*, 27 (1994) 5277-5284; C.A., 121 (1994) 158531a.
- 1019 Krüger, R.-P., Much, H. and Schulz, G.: Determination of functionality and molar mass distribution of aliphatic polyesters by orthogonal liquid chromatography. I. Off-line investigation of poly(1,6-hexanediol adipates). *J. Liq. Chromatogr.*, 17 (1994) 3069-3090.
- 1020 Lehmann, U., Augenstein, M. and Neidhart, B.: Insight into the chemical heterogeneity of cationic polyelectrolytes by gradient-HPLC using salt gradients. *J. Liq. Chromatogr.*, 17 (1994) 3285-3306.
- 1021 Lochmuller, C.H., Jiang, C. and Elomaa, M.: Retention behavior of poly(L-tryptophan)s and poly(D,L-tryptophan)s in reversed-phase liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 3179-3189.
- 1022 Marks, M.J., Erskine, J.S. and McCrery, D.A.: Products and mechanisms of the thermal crosslinking of benzocyclobutane-terminated bisphenol A polycarbonates. *Macromolecules*, 27 (1994) 4114-4126; C.A., 121 (1994) 58742b.
- 1023 Mirabella, F.M., Jr.: Temperature rising elution fractionation (TREF) characterization of polypropylene copolymers. *J. Liq. Chromatogr.*, 17 (1994) 3201-3219.
- 1024 Mori, S. and Taziri, H.: Separation of styrene-acrylonitrile copolymers by stepwise gradient elution - high-performance precipitation liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 3055-3068.
- 1025 Mourey, T.H. and Bryan, T.G.: Size-exclusion chromatography of nylons in methylene chloride-dichloroacetic acid. *J. Chromatogr. A*, 679 (1994) 201-205.
- 1026 Ogino, K., Maruo, T. and Sato, H.: Separation of styrene-butyl methacrylate copolymers by high performance liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 3025-3041.
- 1027 Pasch, H. and Zammert, I.: Chromatographic investigations of macromolecules in the critical range of liquid chromatography. VIII. Analysis of polyethylene oxides. *J. Liq. Chromatogr.*, 17 (1994) 3091-3108.
- 1028 Pille, L. and Solomon, D.H.: Studies on microgels. 1. Microgel formation studied by gel-permeation chromatography with an online light scattering detector. *Macromol. Chem. Phys.*, 195 (1994) 2477-2489; C.A., 121 (1994) 84726u.
- 1029 Podzimek, S.: Characterization of synthetic resins by gel permeation chromatography with a multi-angle laser light scattering detector. *J. Chromatogr. A*, 677 (1994) 21-24.
- 1030 Reid, S.P., Meehan, E. and Dawkins, J.V.: Compositional separation of poly(vinyl alcohol) using a reverse phase packing in HPLC. *J. Liq. Chromatogr.*, 17 (1994) 3043-3053.
- 1031 Rissler, K. and Fuchsleger, U.: Separation of polybutylene glycols on C₁₈ and C₄ stationary phases. *J. Liq. Chromatogr.*, 17 (1994) 2791-2808.
- 1032 Rissler, K., Fuchsleger, U. and Grether, H.J.: Separation of polyethylene glycol oligomers on normal-phase and reversed-phase materials by gradient high performance liquid chromatography and detection by evaporative light scattering. A comparative study. *J. Liq. Chromatogr.*, 17 (1994) 3109-3132.
- 1033 Schimpf, M.E., Russell, D.D. and Lewis, J.K.: Separation of charged latex particles by electrical field-flow fractionation. *J. Liq. Chromatogr.*, 17 (1994) 3221-3238.
- 1034 Shalliker, R.A., Kavanagh, P.E. and Russell, I.M.: Comparison of isocratic and gradient elution reversed-phase behaviour of high-molecular-mass polystyrenes in dichloromethane and acetonitrile. *J. Chromatogr. A*, 679 (1994) 105-114.
- 1035 Staal, W.J., Cools, P., van Herk, A.M. and German, A.L.: Monitoring of originated polymer in pure monomer with gradient polymer elution chromatography (GPEC). *J. Liq. Chromatogr.*, 17 (1994) 3191-3199.
- 1036 Tang, M.T.: An efficient sample preparation technique for high-temperature gel permeation chromatography. *Tappi J.*, 76 (1993) 157-160; C.A., 121 (1994) 110225b.
- 1037 Wang, T.-W.: Chromatographic separation of polymer mixtures using combined adsorption-size exclusion mechanisms. Avail. *Univ. Microfilms Int.*, Order N. DA9414473, 1993, 174 p.; C.A., 121 (1994) 158502s.
- 1038 Wyatt, P.J. and Papazian, L.A.: The interdetector volume in modern light scattering and high performance size-exclusion chromatography. *LC-GC*, 11 (1993) 862-872; C.A., 121 (1994) 84469n.

For additional information see C.A.:

121 (1994) 112536c.

See also 6, 26, 1197.

32. DRUG ANALYSIS

32a. Drug analysis, general techniques

- 1039 Bliesner, D.M.: Graphical correlation of TLC and HPLC data in the development of pharmaceutical compounds. *J. Planar Chromatogr.*, 7 (1994) 197-201.
- 1040 Blunk, T., Mak, E. and Mueller, R.H.: Characterization of colloidal drug carriers. Determination of surface hydrophobicity by hydrophobic-interaction chromatography. *Pharm. Ind.*, 55 (1993) 612-615; C.A., 121 (1994) 186938g.
- 1041 Haasnoot, W., Ezkerro, S.M. and Keukens, H.: Application of immunochemical selectivity for screening and confirmation of animal drug residues in biological samples. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 347-351; C.A., 121 (1994) 156012h.
- 1042 Hamoip, T., Bourguignon, B. and Massart, D.L.: Validation of a strategic approach to high-performance liquid chromatographic method selection. *Chromatographia*, 39 (1994) 339-345.
- 1043 Hill, D.W. and Kind, A.J.: Reversed-phase solvent-gradient HPLC retention indexes of drugs. *J. Anal. Toxicol.*, 18 (1994) 233-242.

- 1044 Neue, U.D., Phillips, D.J., Walter, T.H., Capparelo, M., Alden, B. and Fisk, R.P.: Reverse-phase column quality and its effect on the quality of a pharmaceutical analysis. *LC-GC*, 12 (1994) 468-480; *C.A.*, 121 (1994) 91968c.
- 1045 Ng, C.L., Ong, C.P., Lee, H.K. and Li, S.F.Y.: Determination of pharmaceuticals and related impurities by capillary electrophoresis. *J. Chromatogr. A*, 680 (1994) 579-586.
- 1046 Porter, S. and Johnston, N.: The application of narrow-bore HPLC columns to the analysis of veterinary drugs. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 538-542; *C.A.*, 121 (1994) 124467u.
- 1047 Rekker, R.F. and de Vries, G.: A basic confrontation of Rekker's revised Σf -system with HPLC retention data obtained on a mixed series of aliphatic and aromatic hydrocarbons. In: Werthmuß, C.-G. (Editor), *Trends QSAR Mol. Modell.*, 9th 1992, ESCOM, Leiden, 1993, pp. 132-136; *C.A.*, 121 (1994) 73061x.
- 1048 Robson, J.N., Draper, S. and Tennant, K.: Atmospheric pressure ionization liquid chromatography-mass spectrometry in the quantification of drugs in biological fluids. *Anal. Proc.*, 31 (1994) 159-161; *C.A.*, 121 (1994) 169541e.
- 1049 Shah, K.P., Zhou, J., Lee, R., Schowen, R.L., Elsbernd, R., Ault, J.M., Stobaugh, J.F., Slavik, M. and Riley, C.M.: Automated analytical systems for drug development studies. I - A system for the determination of drug stability. *J. Pharm. Biomed. Anal.*, 12 (1994) 993-1001.
- 1050 Van der Greef, J., Arts, C.J.M., van Baak, M. and Verheij, E.R.: Possibilities of liquid chromatography-mass spectrometry in drug residue analysis. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food Proc. EuroResidue Conf.*, 2nd 1993, 1, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 35-40; *C.A.*, 121 (1994) 156003f.
- 1051 Zhou, Y., Luan, P., Liu, L. and Sun, Z.P.: Chiral derivatizing reagents for drug enantiomers bearing hydroxyl groups. *J. Chromatogr. B*, 659 (1994) 109-126 - a review with 54 refs.
- See also 99, 133, 136, 157, 159, 328, 956.
- 32b. *Antirheumatics and antiinflammatory drugs*
- 1052 De Vries, J.X., Schmitz-Kummer, E. and Siemon, D.: The analysis of ibuprofen enantiomers in human plasma and urine by high-performance liquid chromatography on an α 1-acid glycoprotein chiral stationary phase. *J. Liq. Chromatogr.*, 17 (1994) 2127-2145.
- 1053 Foda, N.H. and Al Gohary, O.M.: High performance liquid chromatographic determination of flurbiprofen in pharmaceutical dosage forms. *Anal. Lett.*, 27 (1994) 2523-2534.
- 1054 Guentert, T.W., Stebler, T., Banken, L., Defoin, R. and Schmitt, M.: Relative bioavailability of oral dosage forms of texoxicam. *Arzneim.-Forsch.*, 44 (1994) 1051-1054.
- 1055 Joshi, A.S., Raghavan, N., Williams, R.M., Takahashi, K., Shingu, H. and King, S.-Y.P.: Simultaneous quantification of an anti-inflammatory compound (DuP 697) and a potential metabolite (X6882) in human plasma and urine by high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 143-150.
- 1056 Niazy, E.M., Khidr, S.H. and El-Sayed, Y.M.: High-performance liquid chromatographic determination of meclofenamate sodium in plasma. *J. Liq. Chromatogr.*, 17 (1994) 2331-2341.
- 1057 Nivaud-Guerret, E., Guernet, M., Ivanovic, D. and Medenica, M.: Effect of eluent pH on the ionic and molecular forms of the non-steroidal anti-inflammatory agents in reversed-phase high-performance liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2343-2357.
- 1058 Van Overbeke, A., Baeyens, W., van den Bossche, W. and Dewaele, C.: Enantiomeric separation of amide derivatives of some 2-arylpropionic acids by HPLC on a cellulose-based chiral stationary phase. *J. Pharm. Biomed. Anal.*, 12 (1994) 911-916.
- 1059 Wakabayashi, H., Yamato, S., Nakajima, M. and Shimada, K.: Application of an electrochemical detector with a graphite electrode to liquid chromatographic determination of penicillamine and captopril in biological samples. *J. Pharm. Biomed. Anal.*, 12 (1994) 1147-1152.
- For additional information see *C.A.*:
121 (1994) 199921w.
- See also 1125.
- 32c. *Autonomic and cardiovascular drugs*
- 1060 Bernard, N., Lush, M., Proibits, J., Ferry, N., Cuisinaud, G. and Sassard, J.: Determination of piroximone in plasma and urine by high performance liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2187-2197.
- 1061 Boulieu, R.: Solid-phase extraction method for the determination of diltiazem and its metabolites by high-performance liquid chromatography: fact or fallacy? *J. Chromatogr. B*, 660 (1994) 221-222.
- 1062 Chapeau, V., Moulin, A., Caude, M. and Dufour, A.: High-performance liquid chromatographic determination of oxodipine enantiomers, a new 1,4-dihydropyridine, applied to stereoselectivity studies in man and dog. *J. Chromatogr. B*, 660 (1994) 341-346.
- 1063 Di Pietra, A.M., Roveri, P., Gotti, R. and Cavrini, V.: Spectrophotometric and chromatographic (HPLC) analysis of hydralazine, dihydralazine and hydrazine after derivatization with 2-nitrocinnamaldehyde. *Farmaco*, 48 (1993) 1555-1567; *C.A.*, 121 (1994) 91992f.
- 1064 Fujimaki, M.: Oxidation of R(+) and S(-)-carvediol by rat liver microsomes. Evidence for stereoselective oxidation and characterization of the cytochrome P450 isozymes involved. *Drug Metab. Disp.*, 22 (1994) 700-708.
- 1065 Hasegawa, T., Hara, K. and Hata, S.: Binding of dorzolamide and its metabolite, N-deethylated dorzolamide, to human erythrocytes *in vitro*. *Drug Metab. Disp.*, 22 (1994) 377-382.
- 1066 Hubert, P. and Crommen, J.: HPLC determination of verapamil and norverapamil in plasma using automated solid phase extraction for sample preparation and fluorometric detection. *J. Liq. Chromatogr.*, 17 (1994) 2147-2170.
- 1067 Laganière, S., Goernert, L. and Beatch, G.: High-performance liquid chromatographic assay for sematilide in plasma using solid-phase extraction microcolumn technology. *J. Chromatogr. B*, 660 (1994) 191-195.

- 1068 Lankford, S.M., Maskasame, C. and Bai, S.A.: Effects of diltiazem on the disposition and metabolism of the enantiomers of propranolol in the dog during multiple oral dosing. *Drug Metab. Disp.*, 22 (1994) 776-787.
- 1069 Li, F., Cooper, S.F., Côté, M. and Ayotte, C.: Determination of the enantiomers of bunolol in human urine by high-performance liquid chromatography on a chiral AGP stationary phase and identification of their metabolites by gas chromatography-mass spectrometry. *J. Chromatogr. B*, 660 (1994) 327-339.
- 1070 Lippi, A., Criscuoli, M., Sardelli, G. and Subissi, A.: High-performance liquid chromatographic method with electrochemical detection for the determination of idrapril, a novel angiotensin-converting enzyme inhibitor, in biological matrices. *J. Chromatogr. B*, 660 (1994) 127-134.
- 1071 Misztal, G. and Hopkala, H.: Determination of aprindine and nadoxolol in pharmaceuticals by HPLC. *Pharmazie*, 49 (1994) 697-698.
- 1072 Misztal, G. and Przyborowski, L.: Determination of nadoxolol in human plasma using reversed-phase high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 409-411.
- 1073 Modamio, P., Lastra, C.F. and Marino, E.L.: Determination of celiprolol by high-performance liquid chromatography and stability in solution. *Int. J. Pharm.*, 107 (1994) 243-245; *C.A.*, 121 (1994) 42882m.
- 1074 Murkitt, G.S., Trafankowska, E.Z., Dunne, M. and Manchee, G.R.: Fully automated assay for the determination of GR117289X in human plasma using mixed mode solid-phase extraction and high-performance liquid chromatography with ultraviolet detection. *J. Pharm. Biomed. Anal.*, 12 (1994) 1181-1187.
- 1075 Narimatsu, S., Huang, Y., Mizukami, T., Masobuchi, Y. and Suzuki, T.: Development of a high-performance liquid chromatographic method for the analysis of enantiomer/enantiomer interaction in oxidative metabolism of bunitrofol in rat liver microsomes. *Anal. Biochem.*, 222 (1994) 256-261.
- 1076 Nielsen, F., Kramer Nielsen, K. and Brøsen, K.: Determination of quinidine, dihydroquinidine, (3S)-3-hydroxyquinidine and quinidine N-oxide in plasma and urine by high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 103-110.
- 1077 Oertel, R., Richter, K., Trausch, B., Berndt, A., Gramatté, T. and Kirch, W.: Elucidation of the structure of talinolol metabolites in man. Determination of talinolol and hydroxylated talinolol metabolites in urine and analysis of talinolol in serum. *J. Chromatogr. B*, 660 (1994) 353-363.
- 1078 Pham-Huy, C., Sahui-Gnassi, A., Saada, V., Gramond, J.P., Galons, H., Ellouk-Achard, S., Levresse, V., Fompeydie, D. and Claude, J.R.: Microassay of propranolol enantiomers and conjugates in human plasma and urine by high-performance liquid chromatography after chiral derivatization for pharmacokinetic study. *J. Pharm. Biomed. Anal.*, 12 (1994) 1189-1198.
- 1079 Romanova, D., Brandsteterova, E., Kralikova, D., Bozekova, L. and Kriska, M.: Determination of verapamil and its metabolites in plasma using HPLC. *Pharmazie*, 49 (1994) 779-780.
- 1080 Sandoval, T.M., Fujitaki, J.M., Chen, L.-S. and Dixon, R.: A simultaneous assay for acadesine (AICA-riboside) and acadesine 5'-monophosphate using ion-pair reverse phase high performance liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2373-2381.
- 1081 Sigusch, H., Henschel, L., Kraul, H., Merkel, U. and Hoffmann, A.: Lack of effect of grapefruit juice on diltiazem bioavailability in normal subjects. *Pharmazie*, 49 (1994) 675-679.
- 1082 Simmons, B.R. and Stewart, J.T.: HPLC separation of selected cardiovascular agents on underivatized silica using an aqueous organic mobile phase. *J. Liq. Chromatogr.*, 17 (1994) 2675-2690.
- 1083 Sioufi, A., Marfil, F. and Godbillon, J.: Automated determination of an angiotensin II receptor antagonist, CGP 48933, in plasma by high-performance liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2179-2186.
- 1084 Tang, C., Zhang, K., Lepage, F., Levi, R.H. and Baillie, T.A.: Metabolic chiral inversion of stiripentol in the rat. II. Influence of route of administration. *Drug Metab. Disp.*, 22 (1994) 554-560.
- 1085 Ueno, K., Ishida, Y., Kawaguchi, Y., Bito, K. and Konishi, T.: (Effect of other antiarrhythmic drugs, mexiletine and disopyramide on high performance liquid chromatography determination of pilsicainide in plasma). *Pharma Med.*, 12 (1994) 127-130; *C.A.*, 121 (1994) 148217p.
- 1086 Ulvi, V. and Keski-Hynnilä, H.: First-derivative UV spectrophotometric and high-performance liquid chromatographic analysis of some thiazide diuretics in the presence of their photodecomposition products. *J. Pharm. Biomed. Anal.*, 12 (1994) 917-922.
- 1087 Zell, C., Neidlein, R. and Sterin, K.: Biotransformation of the organic nitrate trans-N-(4-nitroxyhexyl)acetamine in dogs. *Arzneim.-Forsch.*, 44 (1994) 1021-1028.
- 1088 Zhang, K., Tang, C., Rashed, M.N., Cui, D., Tombret, F., Botte, H., Lepage, F., Levi, R.H. and Baillie, T.A.: Metabolic chiral inversion of stiripentol in the rat. I. Mechanistic studies. *Drug Metab. Disp.*, 22 (1994) 544-553.
- 1089 Zhong, D. and Blume, H.: HPLC-Bestimmung von Loratadin und seinem aktiven Metaboliten Descarboethoxyloratadin in Humanplasma. *Pharmazie*, 49 (1994) 736-739.
- For additional information see *C.A.*:
121 (1994) 75430r, 141480k.
- See also 125, 953, 960, 1059, 1063.
- 32d. Central nervous system drugs*
- 1090 Abu-Lafi, S., Sterin, M. and Levin, S.: Role of hydroxyl groups in chiral recognition of cannabinoids by carbamated amylose. *J. Chromatogr. A*, 679 (1994) 47-58.
- 1091 Agundez, J.A.G., Martinez, C., Martin, R. and Benitez, J.: Determination of aminopyrine, dipyrone and their metabolites in urine by high-performance liquid chromatography. *Ther. Drug Monit.*, 16 (1994) 316-322; *C.A.*, 121 (1994), 169549p.
- 1092 Banditt, P.: Determination of orotic acid in serum by high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 176-179.
- 1093 Beaulieu, N., Sears, R.W. and Lovering, E.G.: Liquid chromatographic methods for determination of trazodone and related compounds in drug raw materials. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 857-861.
- 1094 Bednarikova, A., Lehotay, J. and Cizmarik, J.: Study of local anaesthetics. Part 123: HPLC study of pentacaine, heptacaine and carbisocaine. *Pharmazie*, 49 (1994) 577-579.

- 1095 Benhamou-Batut, F., Demotes-Mainard, F., Labat, L., Vinçon, G. and Bannwarth, B.: Determination of flunitrazepam in plasma by liquid chromatography. *J. Pharm. Biomed. Anal.*, 12 (1994) 931-936.
- 1096 Bounine, J.P., Tardif, B., Beltran, P. and Mazzo, D.J.: High-performance liquid chromatographic stability-indicating determination of zopiclone in tablets. *J. Chromatogr. A*, 677 (1994) 87-93.
- 1097 Chen, I.-W. and Lin, J.H.: Physiological disposition of L-663,581, a partial agonist of the benzodiazepine receptor, in laboratory animals. *Drug Metab. Disp.*, 22 (1994) 693-699.
- 1098 Dow, J., Piriou, F., Wolf, E., Dulery, B.D. and Haegele, K.D.: Novel carbamate metabolites of mofegiline, a primary amine monoamine oxidase B inhibitor, in dogs and humans. *Drug Metab. Disp.*, 22 (1994) 738-749.
- 1099 Eto, S., Noda, H. and Noda, A.: Simultaneous determination of antiepileptic drugs and their metabolites, including chiral compounds, via β -cyclodextrin inclusion complexes by a column-switching chromatographic technique. *J. Chromatogr. B*, 658 (1994) 385-390.
- 1100 Girault, J., Malgouyat, J.M., Longueville, D., Lecomte, G., Revaud, M. and Fourtillan, J.B.: Quantitative measurement of a new synthetic tetrazepine derivative, BN50730, in human plasma and urine by combined liquid chromatography-negative chemical ionization mass spectrometry using a particle beam interface. *J. Chromatogr. B*, 658 (1994) 289-301.
- 1101 Goldnik, A., Gajewska, M. and Jaworska, M.: Determination of oxazepam and diazepam in body fluids by HPLC. *Acta Pol. Pharm.*, 50 (1993) 421-422; C.A., 121 (1994) 194774r.
- 1102 Guebitz, G., Wintersteiger, R., Nihellyes, S. and Kobinger, G.: Resolution of the enantiomers of barbiturates on a new chiral amino alcohol phase by CLEC. *Quin. Anal. (Barcelona)*, 12 (1993) 45-47; C.A., 121 (1994) 187411s.
- 1103 Hagiwaka, J., Murashima, T., Pinkerton, T.C., Corniskey, J.P., Ulrich, E.L., Markley, J.L. and Walkenhorst, W.F.: (Enantioselectivity of ovomucoid bonded-phase HPLC columns produced with isolated domains). *Kuromatogurai*, 14 (1993) 100-101; C.A., 121 (1994) 91966a.
- 1104 Hansen, B.B. and Hansen, S.H.: Determination of zuclopentixol and its main N-dealkylated metabolite in biological fluids using high-performance liquid chromatography with post-column photochemical derivatization and fluorescence detection. *J. Chromatogr. B*, 658 (1994) 319-325.
- 1105 Holman, J.A. and Danielson, N.D.: Liquid chromatography of antihistamines using post-column tris(2,2'-bipyridine) ruthenium(III) chemiluminescence detection. *J. Chromatogr. A*, 679 (1994) 277-284.
- 1106 Hooper, W.D., Pool, W.F., Woolf, T.F. and Gal, J.: Stereoselective hydroxylation of tacrine in rats and humans. *Drug Metab. Disp.*, 22 (1994) 719-724.
- 1107 Kalisz, R., Kalisz, A., Noctor, T.A.G., Purcell, W.P. and Waine, I.W.: Mechanism of retention of benzodiazepines in affinity, reversed-phase and adsorption high-performance liquid chromatography in view of quantitative structure-retention relationships. In: Wermuth, C.-G. (Editor), *Trends QSAR Mol. Modell.*, 92, Proc. Eur. Symp. Struct.-Act. Relat.: QSAR Mol. Modell., 9th 1992, ESCOM, Leiden, 1993, pp. 109-111; C.A., 121 (1994) 169688h.
- 1108 Kudoh, S., Sato, T., Okada, H., Kumakura, H. and Nakamura, H.: Simultaneous determination of granisetron and 7-hydroxy-granisetron in human plasma by high-performance liquid chromatography with fluorescence detection. *J. Chromatogr. B*, 660 (1994) 205-210.
- 1109 Kuhn, O.S., Silva, G.P. and Fonseca, A.L.: (Simultaneous analysis of some antiepileptic drugs and metabolites by liquid chromatography). *An. R. Acad. Farm.*, 59 (1993) 349-360; C.A., 121 (1994) 72905p.
- 1110 Linhares, M.C. and Kissinger, P.T.: Pharmacokinetic studies using microdialysis probes in subcutaneous tissues: effects of the co-administration of ethanol and acetaminophen. *J. Pharm. Biomed. Anal.*, 12 (1994) 619-627.
- 1111 Macho, M.L. and Munoz, P.: Screening and determination of tranquilizers in porcine urine. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 465-468; C.A., 121 (1994) 124466t.
- 1112 Marescaux, P., Belan, E., Houdret, N., Goudemand, M. and Lhermitte, M.: Simultaneous determination of clomipramine and its demethylated metabolite in plasma and erythrocytes by high-performance liquid chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2171-2177.
- 1113 Nakai, H., Shimamura, Y., Kanazawa, T., Yasuda, S. and Kayano, M.: Determination of a new H⁺-K⁺ ATPase inhibitor (E3810) and its four metabolites in human plasma by high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 211-220.
- 1114 Nichols, J.H., Charlson, J.R. and Lawson, G.M.: Automated HPLC assay of fluoxetine and norfluoxetine in serum. *Clin. Chem. (Washington)*, 40 (1994) 1312-1316.
- 1115 Porter, S., Patel, R. and Johnston, N.: Multiresidue analysis of some tranquilizers and carazolol by HPLC. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 543-547; C.A., 121 (1994) 203622u.
- 1116 Rakestraw, D.C., Bilski, D.A. and Lam, G.N.: Determination of linopirdine and its N-oxide metabolites in rat plasma by liquid chromatography. *J. Pharm. Biomed. Anal.*, 12 (1994) 1055-1061.
- 1117 Rizzi, A.M., Hirz, R., Cladrow-Runge, S. and Jonsson, H.: Enantiomeric separation of amphetamine, methamphetamine and ring substituted amphetamines means of a β -cyclodextrin-chiral stationary phase. *Chromatographia*, 39 (1994) 131-137.
- 1118 Rodrigues, A.D., Ferrero, J.L., Amann, M.T., Rotert, G.A., Cepa, S.P., Surber, B.W., Machinist, J.M., Tich, N.R., Sullivan, J.P., Garvey, D.S. et al.: The *in vitro* hepatic metabolism of ABT-418, a cholinergic channel activator, in rats, dogs, cynomolgus monkeys, and humans. *Drug Metab. Disp.*, 22 (1994) 788-798.
- 1119 Saleh, M.I. and Yoong, C.S.: Determination of codeine, ephedrine and promethazine in cough mixture by reversed-phase high-performance liquid chromatography. *J. Phys. Sci.*, 4 (1993) 55-63; C.A., 121 (1994) 187437e.
- 1120 Sam, E., Augustijns, P. and Verbeke, N.: Stability of apomorphine in plasma and its determination by high-performance liquid chromatography with electrochemical detection. *J. Chromatogr. B*, 658 (1994) 311-317.

- 1121 Shihabi, Z.K. and Oles, K.S.: Felbamate measured in serum by two methods: HPLC and capillary electrophoresis. *Clin. Chem. (Washington)*, 40 (1994) 1904-1908.
- 1122 Solans, A., Carnicero, M., de la Torre, R. and Segura, J.: Simultaneous detection of methylphenidate and its main metabolite, ritalinic acid, in doping control. *J. Chromatogr. B*, 658 (1994) 380-384.
- 1123 Surapaneni, S. and Khalil, S.K.W.: A sensitive HPLC method for the determination of terfenadine and its metabolite in human plasma. *J. Liq. Chromatogr.*, 17 (1994) 2419-2428.
- 1124 Takahara, E., Nagata, O., Kato, H., Ohta, S. and Hirobe, M.: Inter-individual differences of 4-[4-(4-methylphenyl)-phenoxy-1-piperidinyl]butyric acid disposition in rats: possible involvement of genetic polymorphism. *Drug Metab. Disp.*, 22 (1994) 761-769.
- 1125 Tulaganov, A.A., Osikina, L.M., Mikhalev, A.V., Korotkov, M.G. and Arzamastsev, A.P.: (Use of high-performance liquid chromatography for quality control of propynaphenazone). *Farmatsiya (Moscow)*, 41 (1992) 69-70; C.A., 121 (1994) 117916m.
- 1126 Yin, D., Khanolkar, A.D., Makriyannis, A. and Froimowitz, M.: Chiral resolution of 1,3-dimethyl-4-phenylpiperidine derivatives using high-performance liquid chromatography with a chiral stationary phase. *J. Chromatogr. A*, 678 (1994) 176-179.

For additional information see C.A.:

121 (1994) 42856f, 141822y, 141858q, 187420u.

See also 31, 39, 171, 875, 960, 1200, 1208, 1212.

32e. Chemotherapeutics (exc. cytostatics and antibiotics)

- 1127 Alhaque, F., Anchisi, C., Fadda, A.M., Maccioli, A.M. and Travagli, V.: Miconazole, ketoconazole and liposomal preparations: A reversed-phase HPLC determination. *Acta Technol. Legis Med.*, 4 (1993) 169-175; C.A., 121 (1994) 42837a.
- 1128 Aoki, H., Ohshima, Y., Tanaka, M., Okazaki, O. and Hakusui, H.: High-performance liquid chromatographic determination of the new quinolone antibacterial agent DU-6859a in human serum and urine using solid-phase extraction with photolysis-fluorescence detection. *J. Chromatogr. B*, 660 (1994) 365-374.
- 1129 Arenas, R.V. and Johnson, N.A.: Liquid chromatographic fluorescence method for the determination of thiabendazole residues in green bananas and banana pulp. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 710-713.
- 1130 Balitz, G., Benesch-Girke, L. and Hewitt, S.A.: Determination of four sulfonamides and their N4-acetyl metabolites in swine muscle using liquid chromatography/thermospray mass spectrometry. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 1, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 155-159; C.A., 121 (1994) 132498v.
- 1131 Beier, R.C., Rowe, L.D., Abd El-Aziz Nasr, M.I., Elissalde, M.H. and Stanker, L.H.: Extraction and HPLC analysis of halofuginone in chicken serum. *J. Liq. Chromatogr.*, 17 (1994) 2961-2970.
- 1132 Bernal, J.L., del Nozal, M.J., Salas, M., Galante, E. and Lumaret, J.P.: HPLC determination of residual ivermectin in cattle dung following subcutaneous injection. *J. Liq. Chromatogr.*, 17 (1994) 2429-2444.
- 1133 Blanchflower, W.J., Cannavan, A. and Kennedy, D.G.: Determination of fenbendazole and oxfendazole in tissues using liquid chromatography/thermospray mass spectrometry. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf., 2nd 1993*, 1, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 191-195; C.A., 121 (1994) 156004g.
- 1134 Boison, J.O.K. and Keng, L.J.-Y.: Determination of sulfamethazine in bovine and porcine tissues by reversed-phase liquid chromatography. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 558-564.
- 1135 Clement, B. and Jung, F.: N-Hydroxylation of the antiprotozoal drug pentamidine catalyzed by rabbit liver cytochrome P-450 2C3 or human liver microsomes, microsomal retroreduction, and further oxidative transformation of the formed amidoximes. Possible relationship to the biological oxidation of arginine to NG-hydroxyarginine, citrulline, and nitric oxide. *Drug Metab. Disp.*, 22 (1994) 486-497.
- 1136 Croteau, L.G., Akhtar, M.H., Bélanger, J.M.R. and Paré, J.R.J.: High performance liquid chromatography determination following microwave assisted extraction of 3-nitro-4-hydroxyphenylarsonic acid from swine liver, kidney, and muscle. *J. Liq. Chromatogr.*, 17 (1994) 2971-2981.
- 1137 Dua, V.K., Sarin, R. and Sharma, V.P.: Sulphadoxine concentrations in plasma, red blood cells and whole blood in healthy and *Plasmodium falciparum* malaria cases after treatment with Fansidar using high-performance liquid chromatography. *J. Pharm. Biomed. Anal.*, 12 (1994) 1317-1323.
- 1138 Furusawa, N. and Mukai, T.: Simultaneous high-performance liquid chromatographic determination of residual sulphamonomethoxine, sulphadimethoxine and their N⁴-acetyl metabolites in foods of animal origin. *J. Chromatogr. A*, 677 (1994) 81-85.
- 1139 Grubb, M.F., Wong, Y.N., Burcham, D.L., Saxton, P.L., Quon, C.Y. and Huang, S.-M.: Pharmacokinetics of HIV protease inhibitor DMP 323 in rats and dogs. *Drug Metab. Disp.*, 22 (1994) 709-712.
- 1140 Guggisberg, D., Mooser, A.E. and Koch, H.: (Screening method for the quantitative determination of twelve sulfonamides in meat, liver, and kidney by HPLC with online post-column derivatization). *Mitt. Geb. Lebensmittelunters. Hyg.*, 84 (1993) 263-273; C.A., 121 (1994) 177951d.
- 1141 Karim, E.I.A., Ibrahim, K.E.E., Abdelrahman, A.N. and Fell, A.F.: Photodegradation studies on chloroquine phosphate by high-performance liquid chromatography. *J. Pharm. Biomed. Anal.*, 12 (1994) 667-674.
- 1142 Kristiansen, G.A., Brock, R. and Bojesen, G.: Comparison of flow injection/thermospray MS/MS and LC/thermospray MS/MS methods for determination of sulfonamides in meat and blood. *Anal. Chem.*, 66 (1994) 3253-3258.
- 1143 Kumar, L., Tothill, J.R. and Ho, K.-B.: Determination of nitrofuran residues in poultry muscle tissues and eggs by liquid chromatography. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 591-595.
- 1144 Law, D., Moore, C.B. and Denning, D.W.: Bioassay for serum itraconazole concentrations using hydroxyitraconazole standards. *Antimicrob. Agents Chemother.*, 38 (1994) 1561-1566; C.A., 121 (1994) 72945b.

- 1145 Lee, T., Pyo, D., Shim, T.-H. and Jeong, E.-H.: High performance liquid chromatographic determination of residual sulfonamide antibacterials in meat using alumina cartridge. *Bull. Korean Chem. Soc.*, 15 (1994) 592-595; C.A., 121 (1994) 156070a.
- 1146 Milner, N.P., Johnson, M.R. and Perry, K.J.: Determination of sulfadimethoxine and ormetoprim residues in channel catfish fillets after treatment with romet and evaluation of a commercially available rapid diagnostic test for drug residues in fish fillets. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 875-881.
- 1147 Mizutani, T., Yoshida, K. and Kawazoe, S.: Formation of toxic metabolites from thiabendazole and other thiazoles in mice. Identification of thioamides as ring cleavage products. *Drug Metab. Disp.*, 22 (1994) 750-755.
- 1148 Muhiq, D.K., Mberu, E.K. and Watkins, W.M.: Differential extraction of artemether and its metabolite dihydroartemisinin from plasma and determination by high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 196-199.
- 1149 Nomeir, A.A., McComish, M.F., Mongan, A.L., Covey, J.M. and Ferrala, N.F.: Liquid chromatographic analysis, stability and protein binding studies of the anti-HIV agent benzoic acid, 2-chloro-5[(1-methylethoxy)thioxomethyl]amino]-, 1-methylethyl ester. *J. Pharm. Biomed. Anal.*, 12 (1994) 693-698.
- 1150 Paulson, G.D., Feil, V.J., Zaylskie, R.G., Giddings, J.M. and Slanger, W.D.: Depletion of residues from milk and blood of cows dosed orally and intravenously with sulfamethazine. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 895-900.
- 1151 Pochopin, N.L., Charman, W.N. and Stella, V.J.: Pharmacokinetics of dapsone and amino acid produgs of dapsone. *Drug Metab. Disp.*, 22 (1994) 770-775.
- 1152 Reuvers, T., Diaz, R., Gomez, J. and Ramos, M.: Determination of ivermectin residues in liver by HPLC-UV and fluorescence detection. Screening and confirmatory method. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B., *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 567-571; C.A., 121 (1994) 203625x.
- 1153 Samuelsen, O.B.: Simultaneous determination of ormetoprim and sulphadimethoxine in plasma and muscle of Atlantic salmon (*Salmo salar*). *J. Chromatogr. B*, 660 (1994) 412-417.
- 1154 Scypinski, S. and Ross, A.J.: Liquid chromatographic separation of zalcitabine and its stereoisomers. *J. Pharm. Biomed. Anal.*, 12 (1994) 1271-1276.
- 1155 Steenbaar, J.G., Hajee, C.A.J. and Haagsma, N.: High-performance liquid chromatographic determination of mebendazole in eel tissue. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 642-645; C.A., 121 (1994) 177974p.
- 1156 Stehly, G.R., Plakas, S.M. and El Said, K.R.: Liquid chromatographic determination of furazolidone in shrimp. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 901-904.
- 1157 Takeba, K., Itoh, T., Matsumoto, M. and Nakazawa, H.: Determination of dephosphate bromofenfos in milk by liquid chromatography with electrochemical detection. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 904-908.
- 1158 Vargas, F., Rivas, C. and Canudas, N.: Photosensitized lipid peroxidation by cinoxacin and its photoproducts. Involvement of a derived peroxide in its phototoxicity. *Pharmazie*, 49 (1994) 742-745.
- 1159 Vree, T.B., van der Ven, A.J.A.M., Verwey-van Wissen, C.P.W.G.M., van Ewijk-Beneken Kolmer, E.W.J., Swolfs, A.E.M., van Galen, P.M. and Amatdjais-Groenen, H.: Isolation, identification and determination of sulfamethoxazole and its known metabolites in human plasma and urine by high-performance liquid chromatography. *J. Chromatogr. B*, 658 (1994) 327-340.
- 1160 Walubo, A., Smith, P. and Folb, P.I.: Comprehensive assay for pyrazinamide, rifampicin and isoniazid with its hydrazine metabolites in human plasma by column liquid chromatography. *J. Chromatogr. B*, 658 (1994) 391-396.
- 1161 Woodcock, J.M., Andrews, J.M., Honeybourne, D. and Wise, R.: Determination of OPC-17116, a new fluoroquinolone, in human alveolar macrophages and other biological matrixes by high performance liquid chromatography (HPLC). *FEMS Microbiol. Lett.*, 119 (1994) 315-320; C.A., 121 (1994) 49549s.

For additional information see C.A.:

121 (1994) 203651c.

See also 154, 925, 965, 996, 1177, 1211.

32f. Cytostatics

- 1162 Abu-Izza, K. and Lu, D.R.: Liquid chromatographic determination of sodium mercaptoundecahydrododecaborate in rat urine and plasma after precolumn derivatization. *J. Chromatogr. B*, 660 (1994) 347-352.
- 1163 Amorusi, P., Lessard, D., Bansal, S.K., Selinger, K., Yacobi, A. and Tonelli, A.P.: Analysis of enloplatin by liquid chromatography and of platinum by atomic absorption spectrometry in various biological fluids. *J. Pharm. Biomed. Anal.*, 12 (1994) 1023-1033.
- 1164 Barker, I.K., Crawford, S.M. and Fell, A.F.: Determination of altretamine in human plasma with high-performance liquid chromatography. *J. Chromatogr. B*, 660 (1994) 121-126.
- 1165 Camacho, M.A., Torres, A.I., Gil, M.E., Obregon, M.M. and Ruz, V.: Qualitative and quantitative determination of two new antitumor agents from 1,8-naphthalimides in tablets: validation of a high-performance liquid chromatography method. *Arzneim.-Forsch.*, 44 (1994) 659-662; C.A., 121 (1994) 164111e.
- 1166 Cummings, J., Fielding, H. and Miller, W.R.: Pharmaceutical analysis of 8-chloroadenosine 3',5'-monophosphate. *J. Pharm. Biomed. Anal.*, 12 (1994) 1289-1294.
- 1167 De Forni, M., Bugat, R., Chabot, G.G., Culine, S., Extra, J.-M., Gouyette, A., Madelaine, I., Marty, M.E. and Mathieu-Boué, A.: Phase I and pharmacokinetic study of the camptothecin derivative irinotecan, administered on a weekly schedule in cancer patients. *Cancer Res.*, 54 (1994) 4347-4354.
- 1168 Dednarski, P.J., Kratochvil, N.A. and Otto, A.M.: Reversible and irreversible interactions of a cisplatin analog bearing a 1,2-diphenylethylenediamine ligand with plasma and plasma proteins *in vitro*. *Drug Metab. Disp.*, 22 (1994) 419-427.
- 1169 Funakoshi, K.-i., Yamashita, K., Chao, W.-f., Yamaguchi, M. and Yashiki, T.: High-performance liquid chromatographic determination of busulfan in human serum with on-line derivatization, column switching and ultraviolet absorbance detection. *J. Chromatogr. B*, 660 (1994) 200-204.

- 1170 Hanson, R.L., Wasyluk, J.M., Nanduri, V.B., Cazzulino, D.L., Patel, R.N. and Szarka, L.J.: Site-specific enzymatic hydrolysis of taxanes at C-10 and C-13. *J. Biol. Chem.*, 269 (1994) 22145-22149.
- 1171 Husain, S., Alvi, S.N. and Nageswara Rao, R.: Separation and determination of E- and Z-isomers of tamoxifen by ion-pair high-performance liquid chromatography. *Anal. Lett.*, 27 (1994) 2485-2497.
- 1172 Johansson, M. and Bielenstein, M.: Determination of 4-hydroxycyclophosphamide in plasma, as 2,4-dinitrophenylhydrazone derivative of aldophosphamide, by liquid chromatography. *J. Chromatogr. B*, 660 (1994) 111-120.
- 1173 Maas, B., Huber, C. and Krämer, I.: Stabilität von Bendamustinhydrochlorid in Infusionslösungen. *Pharmazie*, 49 (1994) 775-777.
- 1174 Noteborn, H.P.J.M., Varosseau, F.J., Monshouwer, M., Brands, R. and Pinedo, H.M.: A reversed-phase high-performance liquid chromatographic method for the determination of Clanzfenur in rat and human plasma. *J. Pharm. Biomed. Anal.*, 12 (1994) 937-942.
- 1175 Proksch, B., Blanz, J., Zeller, K.-P. and Ehninger, G.: Detection and separation of the anthrapyrazole CI-941 and its metabolites in serum and urine by high-performance liquid chromatography. *J. Chromatogr. B*, 658 (1994) 349-353.
- 1176 Wafelman, A.R., Konings, M.C.P., Rosing, H., Hoefnagel, C.A., Taal, B.G., Maes, R.A.A. and Beijnen, J.H.: High-performance liquid chromatographic determination of metaiodobenzylguanidine in whole blood and plasma of cancer patients. *J. Pharm. Biomed. Anal.*, 12 (1994) 1173-1179.

For additional information see C.A.:
121 (1994) 163843h.

See also 891, 964, 1219, 1223.

32g. Other drug categories

- 1177 Barker, S.A. and Long, A.R.: Preparation of milk samples for immunoassay and liquid chromatographic screening using matrix solid-phase dispersion. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 848-854.
- 1178 Benesova, K. and Pavlek, Z.: Method for determining of 1-(4-amino-4-oxo-3,3-diphenylbutyl)-1-methylpiperidinium bromide and 2-(4-(2-(1-piperidinyl)ethoxy)benzoyl)benzoic acid methyl ester in pharmaceutical liquids. *Czech. Rep. Cz* 277,865 (Cl. G01N30/02), 16 Jun. 1993, Appl. 4,695, 07 Aug. 1989; 4 p.; C.A., 121 (1994) 92025e.
- 1179 Beysens, A.J., Beuman, G.H., van der Heijden, J.J., Hooglanders, K.E.J., Steijger, O.M. and Lingeman, H.: Determination of tacrolimus (FK 506) in whole blood using liquid chromatography and fluorescence detection. *Chromatographia*, 39 (1994) 490-496.
- 1180 Brownsill, R., Combal, J.P., Taylor, A., Bertrand, M., Luijten, W. and Walther, B.: The application of electrospray and neutral-loss mass spectrometry to the identification of the metabolites of S12813 in rat liver slices. *Rapid Commun. Mass Spectrom.*, 8 (1994) 361-365; C.A., 121 (1994) 72997v.
- 1181 Chan, K.C., Majadly, F., McCloud, T.G., Muschik, G.M., Issaq, H.J. and Snader, K.M.: Micellar electrokinetic chromatography of the anti-human immunodeficiency virus (HIV) agent michellamine B with absorption and laser-induced fluorescence detection. *Electrophoresis (Weinheim)*, 15 (1994) 1310-1315.
- 1182 Chellquist, E.M., Searle, R., Ladd, D.L. and Hollister, R.K.: Binding constant determination of WIN 22169, a novel polymeric ligand. *J. Pharm. Biomed. Anal.*, 12 (1994) 1015-1022.
- 1183 Constanzer, M.L., Chavez, C.M. and Matuszewski, B.K.: Picogram determination of finasteride in human plasma and semen by high-performance liquid chromatography with atmospheric-pressure chemical-ionization tandem mass spectrometry. *J. Chromatogr. B*, 658 (1994) 281-287.
- 1184 Crump, K.L., McIntyre, I.M. and Drummer, O.H.: Simultaneous determination of morphine and codeine in blood and bile using dual ultraviolet and fluorescence high-performance liquid chromatography. *J. Anal. Toxicol.*, 18 (1994) 208-212.
- 1185 Dou, L., Zeng, J.-N., Gerochi, D.D., Duda, M.P. and Stuting, H.H.: Chiral high-performance liquid chromatography methodology for quality control monitoring of dextrofluoramine. *J. Chromatogr. A*, 679 (1994) 367-374.
- 1186 Epernol, R.O., Ackerman, R., Porter, J.B., Hider, R.C., Damani, L.A. and Singh, S.: HPLC determination of 1,2-diethyl-3-hydroxypyridin-4-one (CP94), its iron complex [Fe(III)](C94)₃] and glucuronide conjugate [CP94-GLUC] in serum and urine of thalassaemic patients. *J. Pharm. Biomed. Anal.*, 12 (1994) 923-930.
- 1187 Ficarra, R., Ficarra, P., Tommasini, S., Calabro, M.L. and Carulli, M.: (Stability determination of roxatidine and release from pharmaceuticals by HPLC). *Acta Technol. Legis. Med.*, 4 (1993) 109-120; C.A., 121 (1994) 42858h.
- 1188 Hand, E.L., Gilbert, J.D., Yuan, A.S., Olah, T.V. and Hichens, M.: Determination of MK-383, a non-peptide fibrinogen receptor antagonist, in human plasma and urine by radioimmunoassay. *J. Pharm. Biomed. Anal.*, 12 (1994) 1047-1053.
- 1189 Herráez-Hernández, R., Soriano-Vega, E. and Campins-Falcó, P.: High-performance liquid chromatographic determination of spironolactone and its major metabolite canrenone in urine using ultraviolet detection and column-switching. *J. Chromatogr. B*, 658 (1994) 303-310.
- 1190 Jayewardene, A.L., Seneviratne, A.K. and Gambertoglio, J.G.: Paired ion reversed-phase HPLC assay for the simultaneous determination of iothalamic acid and para aminohippuric acid in plasma. *J. Liq. Chromatogr.*, 17 (1994) 2395-2412.
- 1191 Kishimoto, M., Kawamori, R., Kamada, T. and Inaba, T.: Carbonyl reductase activity for acetohexamide in human erythrocytes. *Drug Metab. Disp.*, 22 (1994) 367-370.
- 1192 Krieter, P.A., Colletti, A.E., Doss, G.A. and Miller, R.R.: Disposition and metabolism of the hypoglycemic agent pioglitazone in rats. *Drug Metab. Disp.*, 22 (1994) 625-630.
- 1193 Lai, C.-M., Brogdon, B., Quon, C.Y. and Pieniaszek, H.J., Jr.: Determination of DuP 128, an ACAT inhibitor and its sulphoxide and sulphone metabolites in human plasma by liquid chromatography. *J. Pharm. Biomed. Anal.*, 12 (1994) 1163-1172.
- 1194 Murata, Y., Hase, M., Tsunakawa, A., Kodama, H. and Abe, T.: (Identification of a metabolite of triethylene tetramine (TRIEN), a therapeutic drug of Wilson's disease). *Biomed. Res. Trace Elem.*, 4 (1993) 185-186; C.A., 121 (1994) 148242t.

- 1195 Oertel, R., Richter, K., Dobrev, D., Berndt, A. and Gramatté, T.: Eine empfindliche HPLC-Methode zur Bestimmung von Triamteren im Serum. *Pharmazie*, 49 (1994) 700-702.
- 1196 Ohta, T., Shiotani, K., Takamiya, I. and Takitani, S.: (Column-switching HPLC determination of suphonamide diuretics using carbonic anhydrase-immobilized precolumn). *Kuromatogurafu*, 14 (1993) 34-35; C.A., 121 (1994) 65686q.
- 1197 Oliva, A., Armas, H. and Fariña, J.B.: HPLC determination of polyethylene glycol 400 in urine: oligomeric profile in healthy and celiac disease subjects. *Clin. Chem. (Washington)*, 40 (1994) 1571-1574.
- 1198 Perotti, B.Y.T., Prueksaritanont, T. and Benet, L.Z.: HPLC assay for FK 506 and two metabolites in isolated rat hepatocytes and rat liver microsomes. *Pharm. Res.*, 11 (1994) 844-847; C.A., 121 (1994) 72920q.
- 1199 Pramar, Y.V. and das Gupta, V.: Solubilization of spironolactone by cosolvents. *Pharmazie*, 49 (1994) 661-665.
- 1200 Ring, B.J., Parli, C.J., George, M.C. and Wrighton, S.A.: In vitro metabolism of zatosetron. Interspecies comparison and role of CYP 3A. *Drug Metab. Disp.*, 22 (1994) 352-357.
- 1201 Seneviratne, A.K., Jayewardene, A.L. and Gamborgolio, J.G.: Paired ion reversed-phase HPLC assay for the determination of iothalamic acid and para aminohippuric acid in urine. *J. Pharm. Biomed. Anal.*, 12 (1994) 1311-1316.
- 1202 Thompson, R., Grinberg, N., Perpall, H., Bicker, G. and Twy, P.: Separation of organophosphonates by ion chromatography with indirect photometric detection. *J. Liq. Chromatogr.*, 17 (1994) 2511-2531.
- 1203 Tsai, E.W., Chamberlin, S.D., Forsyth, R.J., Bell, C., Ip, D.P. and Brooks, M.A.: Determination of bisphosphonate drugs in pharmaceutical dosage formulations by ion chromatography with indirect UV detection. *J. Pharm. Biomed. Anal.*, 12 (1994) 983-991.
- 1204 Turberg, M.P., Macy, T.D., Lewis, J.J. and Coleman, M.R.: Determination of ractopamine hydrochloride in swine, cattle, and turkey feeds by liquid chromatography with coulometric detection. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 840-847.
- 1205 Wilkes, A.J., Walraven, G. and Talbot, J.-M.: Determination of cocoamidopropyl betaine in raw materials and various cosmetic and detergent finished products by HPLC. *Commun. Jorn. Com. Esp. Deterg.*, 25 (1994) 209-220; C.A., 121 (1994) 186756w.
- 1206 Xu, X.: (Methods to measure cyclosporine levels). *Zhongguo Yaoyue Zazhi*, 29 (1994) 193-195; C.A., 121 (1994) 72879h - a review with 20 refs.
- 1207 Yamamoto, K., Fukada, N., Shiroi, S., Shiozuki, Y., Nagata, Y., Tani, T. and Sakai, T.: Effects of dietary fat levels on the absorption and tissue accumulation of probucol in the rat. *Arzneim.-Forsch.*, 44 (1994) 1059-1062.
- For additional information see C.A.:
121 (1994) 91995j, 117904f, 141868t.
- See also 162, 164, 466, 872, 954, 968, 972, 1049, 1105, 1119, 1171.
- 32h. *Toxicological and forensic applications*
- 1208 Borggaard, B. and Joergensen, I.: Urinary screening for benzodiazepines with radioreceptor assay: comparison with EMIT® d.a.u. benzodiazepine assay and high-performance liquid chromatography. *J. Anal. Toxicol.*, 18 (1994) 243-246.
- 1209 Bouchard, M., Dodd, C. and Viau, C.: Improved procedure for the high-performance liquid chromatographic determination of monohydroxylated PAH metabolites in urine. *J. Anal. Toxicol.*, 18 (1994) 261-264.
- 1210 Cherton, J.C., Jellal, A., Lhommet, G., Loutelier, C., Dardoize, F., Lacoste, L. and Subileau, C.: Unexpected production of chaetoglobosins from maize incubated by *Phomopsis leptostromiformis*. I. Isolation and optimization of the production in liquid media by LC monitoring. *Analisis*, 22 (1994) 210-216; C.A., 121 (1994) 101581n.
- 1211 Croes, K., McCarthy, P.T. and Flanagan, R.J.: Simple and rapid HPLC of quinine, hydroxychloroquine, chloroquine, and desethylchloroquine in serum, whole blood, and filter paper-absorbed dry blood. *J. Anal. Toxicol.*, 18 (1994) 255-260.
- 1212 Franssen, R.M.E., Stolk, L.M.L., van den Brand, W. and Smit, B.J.: Analysis of morphine and amphetamine in meconium with immunoassay and HPLC-diode-array detection. *J. Anal. Toxicol.*, 18 (1994) 294-295.
- 1213 Goergens, H.W., Hallier, E., Mueller, A. and Bolt, H.M.: Macromolecular adducts in the use of methyl bromide as fumigant. *Toxicol. Lett.*, 72 (1994) 199-203; C.A., 121 (1994) 101347r.
- 1214 Margel, S. and Marcus, L.: Model systems employing affinity chromatography for extraction of toxic substances directly from whole blood. *Mol. Interact. Biosep.*, (1993) 433-450; C.A., 121 (1994) 172366g.
- 1215 Roybal, J.E., Munns, R.K., Holland, D.C., Hurlbut, J.A. and Long, A.R.: A method for the determination of thionin, a metabolite of methylene blue, in milk by VIS/LC. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 601-605; C.A., 121 (1994) 177972m.
- For additional information see C.A.:
121 (1994) 51632g, 101385b, 127219a, 127220u, 150659c.
- See also 151, 194, 206, 208, 213, 237, 832, 849, 859, 1090, 1281.
- 32i. *Plant extracts*
- 1216 Deutsch, H.F., Evenson, M.A., Drescher, P., Sparwasser, C. and Madsen, P.O.: Isolation and biological activity of aspidospermine and quebrachamine from an Aspidosperma tree source. *J. Pharm. Biomed. Anal.*, 12 (1994) 1283-1287.
- 1217 Grimminger, W. and Witthohn, K.: Analytics of senna drugs with regard to the toxicological discussion of anthranoids. *Pharmacology*, 47 (1993) 98-109; C.A., 121 (1994) 98922s.
- 1218 Guilleraud, L., Ollivier, E., Elias, R. and Balansard, G.: Determination of harpagide, 8-para-coumaroyl harpagide, and harpagoside by high performance liquid chromatography in *Harpagophytum procumbens* drugs and in a commercial extract. *J. Liq. Chromatogr.*, 17 (1994) 1951-1960.

- 1219 Kopycki, W.J., ElSohly, H.N. and McChesney, J.D.: HPLC determination of taxol and related compounds in *Taxus* plant extracts. *J. Liq. Chromatogr.*, 17 (1994) 2569-2591.
- 1220 Mayoral, A.M., Gutiérrez, C., Ruiz, M.L. and Castañera, P.: A high performance liquid chromatography method for quantification of DIBOA, DIMBOA, and MBOA from aqueous extracts of corn and winter cereal plants. *J. Liq. Chromatogr.*, 17 (1994) 2651-2665.
- 1221 Tsai, T.-H., Westly, J., Lee, T.-F. and Chen, C.-F.: Identification and determination of geniposide, genipin, gardenoside, and geniposidic acid from herbs by HPLC/photodiode-array detection. *J. Liq. Chromatogr.*, 17 (1994) 2199-2205.

For additional information see C.A.:
121 (1994) 91977e.

See also 217, 225, 419.

33. CLINICO-CHEMICAL APPLICATIONS

33a. General papers and reviews

- 1222 Krull, I.S., Szulc, M.E., Bourque, A.J., Zhou, F.-X., Yu, J. and Strong, R.: Solid-phase derivatization reactions for biomedical liquid chromatography. *J. Chromatogr. B*, 659 (1994) 19-50 - a review with 116 refs.

33b. Complex mixtures and profiling (single compounds by cross-reference only)

- 1223 Harris, J.W., Rahman, A., Kim, B., Guengerich, F.P. and Collins, J.M.: Metabolism of taxol by human hepatic microsomes and liver slices: participation of cytochrome P450 3A4 and an unknown P450 enzyme. *Cancer Res.*, 54 (1994) 4026-4035.

For additional information see C.A.:
121 (1994) 33407h.

See also 240, 251, 264, 315, 339, 344, 347, 353, 358, 366, 386, 390, 406, 411, 412, 453, 455, 462, 477, 514, 619, 624, 626, 627, 629, 630, 633, 634, 716, 731, 751, 759, 782, 825, 826, 863, 866, 868, 874, 893, 899, 921.

34. FOOD ANALYSIS

34a. General papers and reviews

- 1224 Shiao-Jun, Lima, J.L.F.C., Montenegro, M.C.B.S.M.: (Critical review on the determination of wine characteristics using ion chromatography). *Rev. Port. Farm.*, 43 (1993) 5-21; C.A., 121 (1994) 132437z - a review with 76 refs.

- 34b. Complex mixtures (single compounds by cross-reference only)
- 1225 Czerwiecki, L. and Szymczyk, K.: (Simultaneous determination of aspartame and diketopiperazine in beverages by high performance liquid chromatography). *Pr. Inst. Lab. Badaw. Przem. Spozyw.*, 48 (1993) 31-42; C.A., 121 (1994) 56057h.
- 1226 Fujinari, E.M.: HPLC-CLND application to quantitate aspartame and other nitrogen containing compounds in beverages. *Dev. Food Sci.*, 33 (Shelf Life Studies of Foods and Beverages) (1993) 1038-1048; C.A., 121 (1994) 56062f.
- 1227 Helle, N., Knopfe, C., Mischke, J., Gebhardt, G., Boegl, K.W. and Schreiber, G.A.: (ESR and HPLC investigations for the detection of γ -irradiated eggs). *Z. Lebensm.-Unters. Forsch.*, 197 (1993) 440-443; C.A., 121 (1994) 203739n.
- 1228 Lamuela-Raventos, R.M. and Waterhouse, A.L.: A direct HPLC separation of wine phenolics. *Am. J. Enol. Vitic.*, 45 (1994) 1-5; C.A., 121 (1994) 56065j.
- 1229 Lancas, F.M. and Galhiane, M.S.: Fast routine analysis of light components of alcoholic beverage using large-bore open tubular fused silica column. *Bol. Soc. Chil. Quim.*, 38 (1993) 177-181; C.A., 121 (1994) 56064h.
- 1230 Marchetti, M., Laffi, R., Zucchi, M. and Ramazza, V.: Analytical and management factors concerning the control of pork meat production system. In: Haagsma, N., Ruiter, A. and Czedik-Eysenberg, P.B. (Editors), *Residues Vet. Drugs Food, Proc. EuroResidue Conf.*, 2nd 1993, 2, Utrecht Univ. Fac. Vet. Med., Utrecht, 1993, pp. 479-484; C.A., 121 (1994) 156016n.
- 1231 Mohan, S.B., Perry, L., Malhotra, J.M. and Lyddiatt, A.: Assessment of beer foam stability by high performance liquid immunoaffinity chromatography (HPLIAC). *J. Inst. Brew.*, 99 (1993) 231-236; C.A., 121 (1994) 132658x.
- 1232 Redondo, A., Villanueva, M.J. and Rodríguez, M.D.: High-performance liquid chromatographic determination of dietary fibre in raw and processed carrots. *J. Chromatogr. A*, 677 (1994) 273-278.
- 1233 Sanchez-Muniz, F.J., Cuesta, C. and Garrido-Polonio, M.C.: Evaluation of a sunflower oil used for frying by different analytical indexes and column and gas chromatography. *Z. Ernährungswiss.*, 33 (1994) 16-23; C.A., 121 (1994) 132507x.
- 1234 Winterhalter, P.: Application of countercurrent chromatographic techniques in flavor precursor studies. In: Schreier, P. and Winterhalter, P. (Editors), *Prog. Flavour Precursor Stud. Proc. Int. Conf.*, 1992, Allured, Carol Stream, 1993, pp. 31-44; C.A., 121 (1994) 106737c.

For additional information see C.A.:
121 (1994) 33423k.

See also 154, 211, 215, 220, 226, 227, 237, 241, 252, 259, 287, 318, 326, 329, 331, 336, 340, 341, 345, 357, 393, 395, 402, 421, 422, 428, 433, 445, 451, 454, 642, 644, 678, 821, 851, 869, 895, 897, 904, 910, 911, 919, 920, 924, 925, 927, 932, 933, 939, 941, 943, 945, 955, 962, 963, 966, 971, 976, 999, 1041, 1050, 1111, 1115, 1130, 1133, 1134, 1136, 1138, 1140, 1142, 1145, 1150, 1152, 1215, 1277.

34c. *Organoleptically important compounds (flavors, odors, volatiles)*

- 1235 Full, G. and Schreier, P.: (Covalent chromatography. A valuable method for the aroma analysis of thiols at trace levels). *Lebensmittelchemie*, 48 (1994) 1-4; C.A., 121 (1994) 81188j.
 1236 Winterhalter, P., Full, G., Herderich, M. and Schreier, P.: Application of online coupled chromatographic techniques in flavor precursor studies. In: Schreier, P. and Winterhalter, P. (Editors), *Prog. Flavour Precursor Stud. Proc. Int. Conf.*, 1992, Allured, Carol Stream, 1993, pp. 97-101; C.A., 121 (1994) 104034x.

35. ENVIRONMENTAL ANALYSIS

35a. *General papers and reviews*

- 1237 Brumley, W.C., Brownrigg, C.M. and Grange, A.H.: Capillary liquid chromatography-mass spectrometry and micellar electrokinetic chromatography as complementary techniques in environmental analysis. *J. Chromatogr. A*, 680 (1994) 635-644.
 1238 De Voogt, P.: Chromatographic clean-up methods for the determination of persistent organic compounds in aqueous environmental samples. *TrAC*, 13 (1994) 389-397 - a review with 70 refs.

See also 54, 194, 203, 1240, 1269, 1281.

35b. *Air pollution (complex mixtures; single compounds by cross-reference only)*

For additional information see C.A.:
 121 (1994) 169151c.

See also 236.

35c. *Water pollution (complex mixtures; single compounds by cross-reference only)*

- 1239 Brinkman, U.A.T., Slobodnik, J. and Vreuls, J.J.: Trace-level detection and identification of polar pesticides in surface water: the SAMOS approach. *TrAC*, 13 (1994) 373-381.
 1240 Hennion, M.-C., Pichon, V. nad Barceló, D.: Surface water analysis (trace-organic contaminants) and EC regulations. *TrAC*, 13 (1994) 361-372 - a review with 30 refs.
 1241 Imai, K., Shizukuishi, K., Matsumura, K. and Ishikawa, M.: (Analysis of contaminated level of pesticides in water by LC an LC/MS (liquid chromatography/mass spectrometry)). *Hitachi Hyoron*, 76 (1994) 287-292; C.A., 121 (1994) 90886n - a review with no refs.
 1242 Kloster, G. and Schoester, M.: Determination of tensides in surface water. Development of methods. *CLB Chem. Labor Biotech.*, 44 (1993) 616-623; C.A., 121 (1994) 140900k - a review with 21 refs.
 1243 Kuehl, D.W., Serrano, J. and Naumann, S.: Identification of potentially mutagenic contaminants in the aquatic environment by liquid chromatographic-thermospray mass spectrometric characterization of *in vitro* DNA adducts. *J. Chromatogr. A*, 684 (1994) 113-119.

- 1244 Van der Wal, E.H.R., Brouwer, E.R., Lingeman, H. and Brinkman, U.A.T.: On-line trace enrichment-column liquid chromatography of polar pollutants in surface water using bifunctional membrane-based extraction-disk cartridges. *Chromatographia*, 39 (1994) 239-245.

- 1245 Van Hout, P.J.M. and Brinkman, U.A.T.: The Rhine Basin Program. *TrAC*, 13 (1994) 382-388.

For additional information see C.A.:
 121 (1994) 117124b.

See also 210, 216, 423, 430, 975, 985, 987, 1238, 1267, 1271.

35d. *Soil pollution (complex mixtures; single compounds by cross-reference only)*

- 1246 Godoy, J.M., Godoy, M.L., Carvalho, Z.L. and Lauria, D.C.: Development of a so-called hour method for analysis of plutonium in soil samples. *J. Radioanal. Nud. Chem.*, 177 (1994) 19-26; C.A., 121 (1994) 107304w.
 1247 Szabo, G. and Bulman, R.A.: Comparison of adsorption coefficient (K_{oc}) for soils and HPLC retention factors of aromatic hydrocarbons using a chemically immobilized humic acid column in RP-HPLC. *J. Liq. Chromatogr.*, 17 (1994) 2593-2604.
 1248 Yamasaki, S.: (Development of instrumental techniques for the determination of major trace and ultra-trace elements in soils, plants, and water). *Nippon Dojo Nirayogaku Zasshi*, 65 (1994) 240-243; C.A., 121 (1994) 107290p - a review with 16 refs.

See also 333, 423, 430, 989.

36. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

36a. *Surfactants*

- 1249 Hendayana, S.: Selectivity in micellar liquid chromatography: adsorption of ionic surfactants on hydrophobic silicas. Avail. *Univ. Microfilms Int.*, Order No. DA9411223, 1993, 135 p.; C.A., 121 (1994) 142391u.
 1250 Hoeft, C.E. and Zollars, R.L.: Direct determination of anionic surfactants using ion chromatography. *J. Liq. Chromatogr.*, 17 (1994) 2691-2704.
 1251 Kida, T., Morishima, N., Masuyama, A. and Nakatsuij, J.: New cleavable surfactants derived from glucono-1,5-lactone. *J. Am. Oil Chem. Soc.*, 71 (1994) 705-710.
 1252 Wigman, L.S., Abdel-Kader, H. and Menon, G.K.: Size exclusion chromatography of poloxalene poloxamers: polyethylene glycol-polypropylene glycol co-polymers used to control cattle bloat. *J. Pharm. Biomed. Anal.*, 12 (1994) 719-722.

For additional information see C.A.:
 121 (1994) 159755p, 182412h.

See also 115, 217, 1242.

36b. Antioxidants and preservatives

- 1253 Tajima, K., Hashizaki, M., Yamamoto, K. and Mizutani, T.: Carbonyl reduction of 6-tert.-butyl-2,3-epoxy-1,4-benzoquinone, a metabolite of 3-tert.-butyl-4-hydroxyanisole, by rat liver microsomes and cytosol. *Drug Metab. Disp.*, 22 (1994) 815-818.

See also 130, 419.

36c. Complex mixtures, technical products and unidentified compounds

- 1254 Daloz, D. and Braekman, J.C.: Separation methods: application to the isolation of sponge metabolites. In: Van Soest, R.W.M., van Kempen, T.M.G. and Braekman, J.-C. (Editors), *Sponges Time Space, Proc. Int. Porifera Congr.*, 4th 1993, Balkema, Rotterdam, 1994, pp. 441-452; C.A., 121 (1994) 199829x - a review with many refs.
- 1255 Elaev, N.R. and Baigildina, A.A.: (A neural membrane Na,K-ATPase inhibitor: isolation and general characteristics). *Biokhimiya (Moscow)*, 59 (1994) 389-394.
- 1256 Faimon, J. and Ondracek, Z.: Gel filtration chromatography with HF detector-A useful tool for the study of natural colloids. *Scr.-Geol.*, 23 (1993) 3-15; C.A., 121 (1994) 163508c.
- 1257 Lee, H.K.: HPLC of homologous series of simple organic anions and cations on an anion exchange column. Avail. *Univ. Microfilms Int.*, Order No. DA9325684, 1993, 123 p.; C.A., 121 (1994) 49389q.
- 1258 Luk'yanov, V.I. and Beiko, O.A.: (Analysis of petroleum nitrogenous compounds by types by liquid adsorption chromatography with linear elution). In: Bol'shakov, G.F. (Editor), *Probl. Khim. Nefti*, Nauka, Sib Otd, Novosibirsk, 1992, pp. 56-64; C.A., 121 (1994) 112906y.
- 1259 Perreault, H.: Development of chromatographic and mass spectrometric techniques for the analysis of complex mixtures containing aromatic compounds. Avail. *NLC Order No. DANN76711*, 1992, 345 p.; C.A., 121 (1994) 49425y.

For additional information see C.A.:

121 (1994) 49346y, 49416w, 60999j, 124387t.

See also 56, 132, 196, 217, 431.

37. CELLS, CELLULAR PARTICLES AND SUPRAMOLECULAR STRUCTURES

- 1260 Kuboki, Y., Kanehira, T., Teraoka, K., Yamada, Y.-i. and Tani, H.: Separation of *Streptococcus mutans* MT8148 by hydroxyapatite column chromatography, a new evaluation of bacterial adhesion. *Shika Kiso Igakkai Zasshi*, 36 (1994) 1-8; C.A., 121 (1994) 30136h.
- 1261 Levin, S., Klausner, E. and Muchtar, S.: Characterization of sub-micron MCT o/w emulsions using sedimentation field-flow fractionation (FFF) with power field programming. *J. Pharm. Biomed. Anal.*, 12 (1994) 1115-1121.
- 1262 Postnov, V.N., Bogomolova, N.G. and Novikov, A.G.: (Gel chromatography of influenza virus on macroporous glass modified by the chemical assembly method). *Zh. Prikl. Khim. (S.-Peterburg)*, 67 (1994) 156-157; C.A., 121 (1994) 174266y.

- 1263 Yue, V., Kowal, R., Neargarder, L., Bond, L., Muettteries, A. and Parsons, R.: Miniature field-flow fractionation system for analysis of blood cells. *Clin. Chem. (Washington)*, 40 (1994) 1810-1814.

See also 1127, 1256.

38. INORGANIC COMPOUNDS

38a. Cations

- 1264 Alam, A.M.S., Hossain, A.K.M.A., Quyser, M.A. and Ahmed, E.: Cation-exchange separation of some metal ions in mixed solvents. *J. Bangladesh Chem. Soc.*, 6 (1993) 161-166; C.A., 121 (1994) 194442f.
- 1265 Cammann, K., Robecke, M. and Bettmer, J.: Simultaneous determination of organic ionic lead and mercury species using HPLC. *Fresenius J. Anal. Chem.*, 350 (1994) 30-33.
- 1266 Chabaux, F., Ben Othman, D. and Birck, J.L.: A new Ra-Ba chromatographic separation and its application to Ra mass-spectrometric measurement in volcanic rocks. *Chem. Geol.*, 114 (1994) 191-197; C.A., 121 (1994) 147853f.
- 1267 Edgell, K.W., Longbottom, J.E. and Joyce, R.J.: Ion chromatographic method for dissolved hexavalent chromium in drinking water, groundwater, and industrial wastewater effluents: collaborative study. *J. Assoc. Off. Anal. Chem.*, 77 (1994) 994-1004.
- 1268 Fabbri, D. and Trombini, C.: A novel derivatization procedure for inorganic mercury(II) for HPLC analysis. *Chromatographia*, 39 (1994) 246-248.
- 1269 Goetz, L.: Speciation of trace metals and radiotracers by ion chromatography applied to environmental studies. *J. Trace Microprobe Tech.*, 11 (1993) 159-178; C.A., 121 (1994) 124155r.
- 1270 Gonzales Rodriguez, V., Castro Romero, J.M., Fernandez Solis, J.M., Perez Iglesias, J. and Seco Lago, H.M.: (Application of reverse-phase liquid chromatography in determination of metal ions). *Tec. Lab.*, 15 (1993) 704-705; C.A., 121 (1994) 147941h.
- 1271 Gros, N. and Gorenc, B.: Ion chromatographic determination of alkali and alkaline earth metals in mineral waters. *Chromatographia*, 39 (1994) 448-452.
- 1272 Jakubowski, N., Jepkens, B., Stuwer, D. and Berndt, H.: Speciation analysis of chromium by inductively coupled plasma mass spectrometry with hydraulic high pressure nebulization. *J. Anal. At. Spectrom.*, 9 (1994) 193-198; C.A., 121 (1994) 72632x.
- 1273 Kim, D.W., Kim, C.S., Choi, K.Y., Jeon, Y.S., Jeong, Y.K. and Park, S.U.: (Enrichment of lithium isotopes by cation exchange chromatography). *Anal. Sci. Technol.*, 7 (1994) 201-204; C.A., 121 (1994) 165642r.
- 1274 Kuya, M.K., Ferronato, C.R. and Pinto, O.B.: (Reduction of matrix interference in nickel determination by ion chromatography in cadmium oxide samples). *Quim. Nova*, 17 (1994) 101-103; C.A., 121 (1994) 98642a.

- 1275 Maslowska, J. and Zakrzewski, W.: (Difficulties and methods for overcoming them in the chromatographic separation of the Fe^{3+} , Cr^{3+} , and Al^{3+} ion mixture). *Zesz. Nauk.-Politech. Łódz., Technol. Chem. Spozyw.*, 589 (1993) 107-114; C.A., 121 (1994) 147761z - a review with 98 refs.
- 1276 Mohite, B.S. and Zambare, D.N.: Column chromatographic separation of molybdenum(VI) from hydrobromic acid medium using poly(dibenzo-18-crown-6). *Anal. Lett.*, 27 (1994) 2387-2401.
- 1277 Momplaisir, G.-M., Lei, T. and Marshall, W.D.: Performance of a novel silica T-tube interface for the AAS detection of arsenic and selenium compounds in HPLC column eluate. *Anal. Chem.*, 66 (1994) 3533-3539.
- 1278 Mongay, C., Olmos, C. and Pastor, A.: Prediction of inorganic and organic ion behaviour with polyvalent eluents in ion chromatography. *J. Chromatogr. A*, 683 (1994) 355-365.
- 1279 Moraes, N.M.P. and Shihomatsu, H.M.: Dynamic ion-exchange chromatography for the determination of lanthanides in rock standards. *J. Chromatogr. A*, 679 (1994) 387-391.
- 1280 Prokisch, J., Kovács, B., Györi, Z. and Loch, J.: Interfacing ion chromatography with inductively coupled plasma atomic emission spectrometry for the determination of chromium(III) and chromium(VI). *J. Chromatogr. A*, 683 (1994) 253-260.
- 1281 Sanz-Medel, A., Aizpun, B., Marchante, J.M., Segovia, E., Fernandez, M.L. and Blanco, E.: Vesicle-mediated high-performance liquid chromatography coupled to atomic detection for speciation of toxic elements. *J. Chromatogr. A*, 683 (1994) 233-243.
- 1282 Schlegel, D., Mattusch, J. and Dittrich, K.: Speciation of arsenic and selenium compounds by ion chromatography with inductively coupled plasma atomic emission spectrometry detection using the hydride technique. *J. Chromatogr. A*, 683 (1994) 261-267.
- 1283 Schoppenthau, J. and Dunemann, L.: Hyphenated HPLC/ICP-MS and HPLC/ICP-OES techniques for the characterisation of metal and non-metal species. *Fresenius J. Anal. Chem.*, 349 (1994) 794-799.
- 1284 Wood, D.J.: Complexation and separation of rare earth ions by solvent extraction and ion exchange chromatography with ionizable crown ethers. Avail. *Univ. Microfilms Int.*, Order No. DA9400809, 1993, 141 p.; C.A., 121 (1994) 43676j.
- 1285 Wu, J. and Lu, W.: (Rapid determination of trace copper, manganese, and zinc in pharmaceuticals by ion-chromatography). *Sepu*, 12 (1994) 132-133; C.A., 121 (1994) 65719c.
- 1286 Zappoli, S. and Bottura, C.: Interpretation of the retention mechanism of transition metal cations in ion interaction chromatography. *Anal. Chem.*, 66 (1994) 3492-3499.

For additional information see C.A.:

121 (1994) 53286w, 75443x, 124207j.

See also 102, 179, 886, 1246, 1248.

38b. Anions

- 1287 Chakraborty, D.K.: An accurate fluoride calibration in the presence of strong interference from carbonate in ion chromatography. *J. High Resolut. Chromatogr.*, 17 (1994) 607-608.
- 1288 Nishimura, M. and Hayashi, M.: Alcohols and carbohydrates in chromatographic mobile phase for boric acid determination. *Jpn. Kokai Tokkyo Koho JP 06,167,485 [94,167,485] (Cl. GO1N30/88)*, 14 Jun. 1994, Appl. 92/319,576, 30 Nov. 1992; 3 pp.; C.A., 121 (1994) 174650u.
- 1289 Saari-Nordhaus, R. and Anderson, J.M.: Ion chromatographic analysis of anions using a solid-phase chemical suppressor. *Am. Lab. (Shelton)*, 26 (1994) 28C-28D, 28F, 28H-28I; C.A., 121 (1994) 147854g.

For additional information see C.A.:

121 (1994) 49397r, 98565c, 124267d.

See also 322, 1278.

38d. Volatile inorganic compounds

- 1290 Nakashima, K., Wada, M., Kuroda, N., Akiyama, S. and Imai, K.: High-performance liquid chromatographic determination of hydrogen peroxide with peroxyoxalate chemiluminescence detection. *J. Liq. Chromatogr.*, 17 (1994) 2111-2126.

39. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

- 1291 Koczorowski, T., Furmanek, B. and Sektas, M.: A method for removal of radioactive nucleotides from electrophoretic buffers. *BioTechniques*, 16 (1994) 1030-1031; C.A., 121 (1994) 199904t.

See also 1273.