



Bibliography Section

Liquid Column Chromatography

1. REVIEWS AND BOOKS

- 3842 Barth, H.G., Boyes, B.E. and Jackson, C.: Size exclusion chromatography. *Anal. Chem.*, 68 (1996) 445R-466R - a review with 649 refs.
- 3843 Dorsey, J.G., Cooper, W.T., Siles, B.A., Foley, J.P. and Barth, H.G.: Liquid chromatography: theory and methodology. *Anal. Chem.*, 68 (1996) 515R-568R. - a review with 965 refs.
- 3844 Grom, E., Meier-Rosenkranz, J. and Foeldi, P.: (The future of HPLC). *LaborPraxis*, 20 (1996) 16-22; C.A., 124 (1996) 331111a - a review with 9 refs.
- 3845 Katz, E.D.: *High Performance Liquid Chromatography: Principles and Methods in Biotechnology*. Wiley, Chichester, 1996, 522 pp.; C.A., 124 (1996) 337284f.
- 3846 Krull, I.S., Mazzeo, J.R., Mhatre, R., Szulc, M.E., Stults, J.T. and Bourell, J.H.: Detection and identification in biochromatography. In: Katz, E.D. (Editor), *High Perform. Liq. Chromatogr.: Princ. Methods Biotechnol.*, Wiley, Chichester, 1996, pp. 163-232; C.A., 125 (1996) 4630c - a review with 255 refs.
- 3847 Lough, W.J. and Wainer, I.W. (Editors): *High Performance Liquid Chromatography: Fundamental Principles and Practice*. Blackie, Glasgow, 1996, 276 p.; C.A., 124 (1996) 299873n.
- 3848 Lucy, C.A.: Recent advances in ion chromatography: a perspective. *J. Chromatogr. A*, 739 (1996) 3-13 - a review with 71 refs.
- 3849 Pyrzynska, K.: Speciation analysis of some organic selenium compounds. A review. *Analyst (Cambridge)*, 121 (1996) 77R-83R.
- 3850 Rothman, L.D.: Column liquid chromatography: equipment and instrumentation. *Anal. Chem.*, 68 (1996) 587R-598R - a review with 269 refs.
- 3851 Scott, R.P.W.: The principles of separation by high-performance liquid chromatography. In: Katz, E.D. (Editor), *High Perform. Liq. Chromatogr.: Princ. Methods Biotechnol.*, Wiley, Chichester, 1996, pp. 25-94; C.A., 125 (1996) 4629j - a review with 46 refs.
- 3852 Simpson, C.F.: Introduction to chromatography in biotechnology. In: Katz, E.D. (Editor), *High Perform. Liq. Chromatogr.: Princ. Methods Biotechnol.*, Wiley, Chichester, 1996, pp. 1-24; C.A., 125 (1996) 4628h - a review with 12 refs.
- 3853 Warner, I.M., Soper, S.A. and McGown, L.B.: Luminiscence in chromatography, electrophoresis and flow systems. In: Molecular fluorescence, phosphorescence and chemiluminescence spectrometry. *Anal. Chem.*, 68 (1996) 79R-82R.

3854 Yates, J.R., McCormack, A.L., Link, A.J., Schieltz, D., Eng, J. and Hays, L.: Future prospects for the analysis of complex biological systems using micro-column liquid chromatography - electrospray tandem mass spectrometry. *Analyst (Cambridge)*, 121 (1996) 65R-76R.

See also 3863, 3872, 3887, 3899, 3907, 3912, 3929, 3945, 3957, 3962, 3965, 3967, 3968, 3969, 3972, 4044, 4061, 4077, 4089, 4121, 4129, 4147, 4211, 4254, 4287, 4288, 4290, 4293, 4295, 4306, 4543, 4564, 4569, 4630, 4634, 4637, 4641, 4650, 4682, 4689, 4699, 4702, 4703, 4825, 4838, 4841, 4844, 4846, 4851, 4861, 4873, 4874, 4880, 4944, 4947, 4959.

2. FUNDAMENTALS, THEORY AND GENERAL

2a. General

- 3855 Cavalli, E.J., Guinchard, C. and Moilleron, R.: Global optimization of separation in high-performance liquid chromatography. *J. Chromatogr. Sci.*, 34 (1996) 185-189.
- 3856 Chandwani, R.M., Thornhill, N., Horstmann, B., Karsnas, P. and Titchener-Hooker, N.J.: Exploratory diagnosis of large-scale chromatographic processes by principal component analysis. In: Munack, A. and Schuegerl, K. (Editors), *Comput. Appl. Biotechnol., Postprint Vol. Int. Conf.*, 6th 1995, Elsevier, Oxford, 1995, pp. 35-40; C.A., 124 (1996) 287109e.
- 3857 Dolan, J.W.: Noise problems: a case study. *LC-GC Int.*, 9 (1996) 334-339.
- 3858 Dolan, J.W.: Problems with gradient methods. *LC-GC Int.*, 9 (1996) 278-282.
- 3859 Dolan, J.W.: Readers' questions about mobile-phase additives. *LC-GC Int.*, 9 (1996) 400-403.
- 3860 Fischer, J. and Jandera, P.: Chromatographic behaviour in reversed-phase high-performance liquid chromatography with micellar and submicellar mobile phases: effects of the organic modifier. *J. Chromatogr. B*, 681 (1996) 3-19.
- 3861 García-Alvarez-Coque, M.C., Torres-Lapasió, J.R. and Baeza-Baeza, J.J.: Description of the partitioning behaviour of solutes and data treatment in micellar liquid chromatography with modifiers. *Anal. Chim. Acta*, 324 (1996) 163-173.
- 3862 Haidacher, D., Vailaya, A. and Horvath, C.: Temperature effects in hydrophobic interaction chromatography. *Proc. Natl. Acad. Sci. U.S.A.*, 93 (1996) 2290-2295; C.A., 124 (1996) 225436a.

- 3863 Helfferich, F.G. and Whitley, R.D.: Non-linear waves in chromatography. II. Wave interference and coherence in multicomponent systems. *J. Chromatogr. A.*, 734 (1996) 7-47 - a review with 63 refs.
- 3864 Hu, Y., Zhou, G., Kang, J., Du, Y., Huang, F. and Ge, J.: Assessment of chromatographic peak purity by means of artificial neural networks. *J. Chromatogr. A.*, 734 (1996) 259-270.
- 3865 Kaljurand, M., Valentini, J.R. and Shao, M.: Feedback shift-register sequences versus uniformly distributed random sequences for correlation chromatography. *Anal. Chim. Acta*, 324 (1996) 29-36.
- 3866 Lukulay, P.H. and McGuffin, V.L.: Evolution from univariate to multivariate optimization methods in liquid chromatography. *J. Microcolumn Sep.*, 8 (1996) 211-224; C.A., 125 (1996) 25270a.
- 3867 McCalley, D.V.: Effect of organic solvent modifier and nature of solute on the performance of bonded silica reversed-phase columns for the analysis of strongly basic compounds by high-performance liquid chromatography. *J. Chromatogr. A.*, 738 (1996) 169-179.
- 3868 Ren, F.Y. and Harris, J.M.: Temperature-jump investigation of alkyl chain length effects on sorption/desorption kinetics at reversed-phase chromatographic interfaces. *Anal. Chem.*, 68 (1996) 1651-1657.
- 3869 Rittenhouse, R.C.: HPLC: a computer simulation of high-performance liquid chromatography. *J. Chem. Educ.: Software, Ser. D*, 3D (1996) 20-22, 34-43; C.A., 125 (1996) 9709v.
- 3870 Shirazi, S.G. and Guiochon, G.: On non-linear waves in chromatography. *J. Chromatogr. A.*, 734 (1996) 3-5.
- 3871 Wojciechowski, A. and Pielichowski, J.: A new efficient method of zone spreading correction in gel permeation chromatography. *Polimery (Warsaw)*, 41 (1996) 178-180; C.A., 124 (1996) 318313y.
- See also 3844, 3847, 3875, 3925, 3943, 4309, 4702, 4842, 4939.
- 2b. Thermodynamics and theoretical relationships**
- 3872 Cabezas, H., Jr.: Theory of phase formation in aqueous two-phase systems. *J. Chromatogr. B*, 680 (1996) 3-30 - a review with 98 refs.
- 3873 Frey, G.L. and Grushka, E.: Numerical solution of the complete mass balance equation in chromatography. *Anal. Chem.*, 68 (1996) 2147-2154.
- 3874 Guan, H., Broyles, B.S. and Guiochon, G.: Modeling of the influence of the experimental conditions on the separation of the components of a binary mixture in isocratic overloaded elution preparative chromatography. *J. Chromatogr. A.*, 734 (1996) 49-62.
- 3875 Hatanaka, T. and Ishida, M.: Analysis of separation performance for high performance liquid chromatography. *J. Chem. Eng. Jpn.*, 29 (1996) 336-343; C.A., 124 (1996) 320371j.
- 3876 Heeter, G.A. and Liapis, A.I.: Multi-component perfusion chromatography in fixed bed and periodic counter current column operation. *J. Chromatogr. A.*, 734 (1996) 105-123.
- 3877 Jandera, P.: Lipophilic and polar indices. In: *J. Chromatogr. Libr.*, Vol. 57, 1995, pp. 269-295; C.A., 123 (1995) 245721x.
- 3878 Jandera, P., Posvec, Z. and Vraspir, P.: Mobile phase effects on single component and competitive adsorption isotherms in reversed-phase systems. *J. Chromatogr. A.*, 734 (1996) 125-136.
- 3879 Lee, K.: Development of a mathematical analysis method for the multicomponent separation by displacement development. *Korean J. Chem. Eng.*, 13 (1996) 181-186; C.A., 125 (1996) 14043c.
- 3880 Nemirovskii, A.M.: (Calculations in frontal chromatography). *Zavod. Lab.*, 62 (1996) 13-15; C.A., 124 (1996) 259292j.
- 3881 Quiñones, I. and Guiochon, G.: Application of different isotherm models to the description of single-component and competitive adsorption data. *J. Chromatogr. A.*, 734 (1996) 83-96.
- 3882 Sajonz, P., Yun, T., Zhong, G., Fornstedt, T. and Guiochon, G.: Profiles of large-size system peaks and vacancy bands in liquid chromatography. II. Comparison of experimental and calculated profiles. *J. Chromatogr. A.*, 734 (1996) 75-81.
- 3883 Yun, T. and Guiochon, G.: Modeling of radial heterogeneity in chromatographic columns. II. Separation of a two-component mixture on a column with cylindrical symmetry. *J. Chromatogr. A.*, 734 (1996) 97-103.
- 3884 Zhong, G., Fornstedt, T. and Guiochon, G.: Profiles of large-size system peaks and vacancy bands in liquid chromatography. I. Analytical solution of the ideal model. *J. Chromatogr. A.*, 734 (1996) 63-74.
- See also 3863, 3927, 3953, 3976, 3977, 3990, 4088, 4294, 4296, 4302, 4305, 4307, 4309, 4568, 4917.
- 2c. Relationship between structure and chromatographic behaviour**
- 3885 Collantes, E.R., Tonh, W., Welsh, W.J. and Zielinski, W.L.: Use of moment of inertia in comparative molecular field analysis to model chromatographic retention of nonpolar solutes. *Anal. Chem.*, 68 (1996) 2038-2043.
- 3886 Fields, S.M., Huber, E.W., Vaz, R.J. and Brake, N.W.: Unusual maxima in HPLC retention of an homologous series consisting of longer alkyl chain substitutions. *Anal. Chem.*, 68 (1996) 2379-2385.
- See also 3878.
- 2d. Measurement of physico-chemical and related values**
- 3887 Davydov, D.Ya.: Study of adsorption from solutions by chromatography. *Stud. Surf. Sci. Catal.*, 99 (1996) 673-703; C.A., 124 (1996) 271154e - a review with 27 refs.
- 3888 Torres-Lapasió, J.R., Baeza-Baeza, J.J. and García-Alvarez-Coque, M.C.: On the measurement of dead time in micellar liquid chromatography. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1205-1228.
- For additional information see C.A.:
124 (1996) 271495s.
- See also 3909, 3956, 4052, 4059, 4176, 4205, 4674, 4677, 4679, 4681, 4687, 4690, 4691, 4695, 4864, 4875, 4962.

3. GENERAL TECHNIQUES

3a. Apparatus and accessories

- 3889 Chervet, J.P., Ursem, M. and Salzmann, J.P.: Instrumental requirements for nanoscale liquid chromatography. *Anal. Chem.*, 68 (1996) 1507-1512.
- 3890 Edwards, C., Hammond, K., Delath, N.J., Bates, C.D. and Witzel, A.: (Radial compressed cartridges for flash chromatography). *LaborPraxis*, 20 (1996) 60-64; *C.A.*, 124 (1996) 359504e.
- 3891 Kaye, B., Herron, W.J., Macrae, P.V., Robinson, S., Stopher, D.A., Venn, R.F. and Wild, W.: Rapid solid phase extraction technique for the high-throughput assay of darifenacin in human plasma. *Anal. Chem.*, 68 (1996) 1658-1660.
- 3892 Unger, B. and Dickhardt, R.: Device for packing chromatography columns. *Eur. Pat. Appl.* EP 702,231 (Cl. G01N30/56), 20 Mar. 1996, DE Appl. 4,432,887, 15 Sep. 1994; 7 p.; *C.A.*, 124 (1996) 277266q.

For additional information see *C.A.*:

- 124 (1996) 277337p, 305893n, 305919a, 326352a;
125 (1996) 13946n.

See also 3929, 4701, 4901.

3b. Detectors and detection reagents

- 3893 Cavrini, V., Gotti, R., Andrisano, V. and Gatti, R.: 1,1'-[Ethenylenbis(sulfonyl)]bis-benzene: a useful pre-chromatographic derivatization reagent for HPLC analyses of thiol groups. *Chromatographia*, 42 (1996) 515-520.
- 3894 Cheng, F.-C., Shih, Y., Liang, Y.-J., Yang, L.-L. and Yang, C.-S.: New dual electrochemical detector for microbore liquid chromatography. Determination of dopamine and serotonin in rat striatum dialysates. *J. Chromatogr. B*, 682 (1996) 195-200.
- 3895 Fajer, V., Rodriguez, C., Gonzalez, R., Cossio, G., Martinez, M. and Bravo, O.: Laser polarimeter LP101M and its applications in liquid chromatography. *Proc. SPIE-Int. Soc. Opt. Eng.*, 2730 (1996) 234-237; *C.A.*, 124 (1996) 263899m.
- 3896 Glavina, L.L.M. and Cantwell, F.F.: Electrical double-layer effects and the origin of indirect UV detection in the liquid chromatography of a cationic sample using a cationic probe. *Anal. Chem.*, 68 (1996) 2228-2235.
- 3897 Gustavsson, P.-E. and Larsson, P.-O.: Superporous agarose, a new material for chromatography. *J. Chromatogr. A*, 734 (1996) 231-240.
- 3898 Harna, Z. and Pisa, L.: Monochromator for liquid chromatography. *Czech. Rep. CZ 280,101* (Cl. G01J3/12), 18 Oct. 1995, *Appl.* 3,789, 22 Jun. 1989; 5 p.; *C.A.*, 124 (1996) 302100r.
- 3899 Kiba, N.: Flow reaction detection system desings for sugars and amino acids. In: Lam, S. and Malikin, G. (Editors), *Anal. Appl. Immobilized Enzyme React.*, Blackie, Glasgow, 1994, pp. 22-50; *C.A.*, 124 (1996) 277319j - a review with 33 refs.
- 3900 Koropchak, J.A., Heenan, C.L. and Allen, L.B.: Direct comparison of evaporative light-scattering and condensation nucleation light-scattering detection for liquid chromatography. *J. Chromatogr. A*, 736 (1996) 11-19.

- 3901 Liu, Z., Li, J., Dong, S. and Wang, E.: Improvements in the selectivity of electrochemical detectors for liquid chromatography and flow injection analysis using the self-assembled *n*-alkanethiol monolayer-modified Au electrode. *Anal. Chem.*, 68 (1996) 2432-2436.

- 3902 Mäkinen, M., Piironen, V. and Hopia, A.: Postcolumn chemiluminescence, ultraviolet and evaporative light-scattering detectors in high-performance liquid chromatographic determination of triacylglycerol oxidation products. *J. Chromatogr. A*, 734 (1996) 221-229.

- 3903 Nesterenko, P. and Jones, P.: The comparative investigation of several stationary phases containing iminodiacetic functional groups for the high performance chelating exchange chromatography. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1033-1045.

- 3904 Rebscher, H. and Pyell, U.: In-column versus on-column fluorescence detection in capillary electrochromatography. *J. Chromatogr. A*, 737 (1996) 171-180.

- 3905 Schubert, R.: (A new detector for HPLC analysis). *LaborPraxis*, 20 (1996) 28-32; *C.A.*, 124 (1996) 305969s.

- 3906 Scott, D.L., Penn, L.S. and Weetall, H.H.: Evaluation of the potential usefulness of *in situ* fiber optic sensors for column monitoring in chromatographic separations and purifications. *J. Chromatogr. A*, 736 (1996) 51-59.

- 3907 Shukla, V.K.S.: High-performance liquid chromatography: normal-phase, reverse-phase detection methodology. In: Sebedio, J.-L. and Perkins, E.G. (Editors), *New Trends Lipid Lipoprotein Anal.*, [Proc. Int. Symp.] 1993, AOCS Press, Champaign, 1995, pp. 38-44; *C.A.*, 124 (1996) 311434e - a review with 8 refs.

- 3908 Steiner, F., Beck, W. and Engelhardt, H.: Optimization of indirect ultraviolet detection in high-performance liquid chromatography and capillary electrophoresis. *J. Chromatogr. A*, 738 (1996) 11-23.

- 3909 Suddaby, K.G., Sanaye, R.A., O'Driscoll, K.F. and Rudin, A.: A novel approach in multi-detector SEC analysis; the dependent calibration of each detector. *Polym. Mater. Sci. Eng.*, 69 (1993) 215-216; *C.A.*, 124 (1996) 290770u.

- 3910 Takechi, H., Kamada, S. and Machida, M.: 3-[4-(Bromomethyl)phenyl]-7-(diethylamino)-2H-1-benzopyran-2-one (MPAC-Br): a highly sensitive fluorescent derivatization reagent for carboxylic acids in high-performance liquid chromatography. *Chem. Pharm. Bull.*, 44 (1996) 793-799.

- 3911 Voegel, P.D. and Bladwin, R.P.: Electrochemical detection with copper electrodes in liquid chromatography and capillary electrophoresis. *Am. Lab. (Shelton)*, 28 (1996) 39-45; *C.A.*, 124 (1996) 277333j.

For additional information see *C.A.*:

- 124 (1996) 277407m, 330830x.

See also 3853, 3947, 3958, 4006, 4023, 4037, 4045, 4114, 4115, 4130, 4184, 4222, 4234, 4531, 4555, 4571, 4579, 4672, 4696, 4751, 4843, 4903, 4922, 4954.

3c. Sorbents and columns, packing procedures

- 3912 Ansell, R.J., Kriz, D. and Mosbach, K.: Molecularly imprinted polymers for bioanalysis: chromatography, binding assays and biomimetic sensors. *Curr. Opin. Biotechnol.*, 7 (1996) 89-94; *C.A.*, 124 (1996) 225296e - a review with many refs.

- 3913 Barrett, D.A., Brown, V.A., Davies, M.C. and Shaw, P.N.: Characterization of a range of alkyl-bonded silica HPLC stationary phases: correlation of quantitative surface analysis data with the retention behavior of neutral, acidic, and basic solutes. *Anal. Chem.*, 68 (1996) 2170-2178.
- 3914 Burton, S.C., Haggarty, N.W., Harding, D.R.K., Becker, N.T., Bulthuis, B.A. and Steele, L.M.: Mixed-mode chromatographic resins with pH-based binding affinities for proteins and peptides. *PCT Int. Appl. WO 96 09,116* (Cl. B01J20/32), 28 Mar. 1996, US Appl. 311,100, 23 Sep. 1994; 65 p.; C.A., 125 (1996) 14482v.
- 3915 Crescenzi, C., di Corcia, A., Passariello, G., Samperi, R. and Turnes Carou, M.I.: Evaluation of two new examples of graphitized carbon blacks for use in solid-phase extraction cartridges. *J. Chromatogr. A*, 733 (1996) 41-55.
- 3916 Dale, C.J., Walker, S.G. and Lyddiatt, A.: High performance agarose-based size exclusion media as multifunctional chromatographic supports. In: *IChemE Res. Event-Eur. Conf. Young Res. Chem. Eng.*, 1st, 1995, Vol. 2, Inst. Chem. Eng., Rugby, 1995, pp. 1010-1012; C.A., 123 (1995) 328821f.
- 3917 Delmas, M.P.F. and Ruthven, D.M.: Monolayer coating of capillary chromatographic columns with small zeolite crystals. *Zeolites*, 16 (1996) 313-315; C.A., 124 (1996) 271402j.
- 3918 Deng, Z.: Liquid chromatographic studies of metal ion modified silicas. Avail. *Univ. Microfilms Int.*, Order No. DA9544875, 1996, 295 p.; C.A., 124 (1996) 320413z.
- 3919 Félix, G., Cachau, E., Thienpont, A. and Soulard, M.-H.: Synthesis and chromatographic properties of HPLC chiral stationary phases based upon β -cyclodextrins. *Chromatographia*, 42 (1996) 583-590.
- 3920 Francotte, E.R. and Zhang, T.: Influence of the molecular and supramolecular structure of cellulose-based chiral stationary phases (CSPs) on their chiral recognition ability. *G/T Fachz. Lab.*, 40 (1996) 15-19; C.A., 124 (1996) 277361s.
- 3921 Frey, R.: Ceramic hydroxylapatite. New life for an old technique. *LaborPraxis*, 20 (1996) 40-43; C.A., 125 (1996) 4717m.
- 3922 Frey, R.: Ceramic hydroxylapatite. New life for an old technique. *CLB Chem. Labor Biotech.*, 47 (1996) 116-119; C.A., 125 (1996) 4716k.
- 3923 Grun, M., Kurganov, A.A., Schacht, S., Schüth, F. and Unger, K.K.: Comparison of an ordered mesoporous aluminosilicate, silica, alumina, titania and zirconia in normal-phase high-performance liquid chromatography. *J. Chromatogr. A*, 740 (1996) 1-9.
- 3924 Guan, H., Guiochon, G., Coffey, D., Davis, E., Gulakowski, K. and Smith, D.W.: Study of the physico-chemical properties of some packing materials. II. General properties of the particles. *J. Chromatogr. A*, 736 (1996) 21-30.
- 3925 Karlsson, A. and Charron, C.: Reversed-phase chiral ion-pair chromatography at a column temperature below 0°C using three generations of Hypercarb as solid-phase. *J. Chromatogr. A*, 732 (1996) 245-253.
- 3926 Kempe, M.: Antibody-mimicking polymers as chiral stationary phases in HPLC. *Anal. Chem.*, 68 (1996) 1948-1953.
- 3927 Ma, Z., Whitley, R.D. and Wang, N.-H.L.: Pore and surface diffusion in multicomponent adsorption and liquid chromatography systems. *AIChE J.*, 42 (1996) 1244-1262; C.A., 124 (1996) 320381n.
- 3928 Maisch, A.: (Stationary phase for HPLC with fluorinated hydrocarbon coating). *LaborPraxis*, 20 (1996) 66-73; C.A., 124 (1996) 359510d.
- 3929 Majors, R.E.: New chromatography columns and accessories at the 1996 Pittsburgh Conference, Part I. *LC-GC*, 14 (1996) 190-201; C.A., 124 (1996) 276974g - a review with 3 refs.
- 3930 Majors, R.E.: New chromatography columns and accessories at the 1996 Pittsburgh Conference, Part II. *LC-GC Int.*, 9 (1996) 340-355.
- 3931 Noel, R.J., O'Hare, W.T. and Street, G.: Thiophilic nature of divinylsulphone cross-linked agarose. *J. Chromatogr. A*, 734 (1996) 241-246.
- 3932 Okamoto, Y.: Polysaccharide derivative and separating agent. U.S. US 5,491,223 (Cl. 536-18.7; C08B37/00), 13 Feb. 1996, JP Appl. 91/34,049, 28 Feb. 1991; 8 p.; C.A., 124 (1996) 306040u.
- 3933 Rao, C.S., Beena, B. and Chudasama, U.: The efficacy of zirconium phosphomolybdate over its single salt counterparts. *Indian J. Chem., Sect. A: Inorg., Bio-inorg., Phys., Teor. Anal. Chem.*, 34A (1995) 1012-1014; C.A., 124 (1996) 134093v.
- 3934 Spychaj, T., Bartkowiak, A. and Hunkeler, D.: Metal-containing hydrogels based on polysaccharides. I. Dextran/epichlorohydrin/Mg²⁺. *Int. J. Polym. Anal. Charact.*, 2 (1995) 1-8; C.A., 124 (1996) 290066u.
- 3935 Sudo, Y.: End-capping of octadecylsilylated silica gels by high-temperature silylation. *J. Chromatogr. A*, 737 (1996) 139-147.
- 3936 Swart, R., Brouwer, S., Kraak, J.C. and Poppe, H.: Swelling behaviour and kinetic performance of polyacrylate stationary phases for reversed-phase and normal-phase open-tubular liquid chromatography. *J. Chromatogr. A*, 732 (1996) 201-207.
- For additional information see C.A.:
- 124 (1996) 254904g, 292791a, 292983q, 305914v, 305989y, 306041v, 311478x, 311797a;
 - 125 (1996) 14486z, 14604m, 25233r.
- See also 3868, 3890, 3892, 3897, 3903, 3975, 3981, 3982, 3983, 3985, 4008, 4042, 4083, 4207, 4249, 4287, 4308, 4349, 4562, 4568, 4633, 4674, 4692, 4707, 4804, 4925, 4942.
- 3d. Quantitative analysis
- See 4255, 4350, 4544, 4731.
- 3e. Preparative scale chromatography
- 3937 Levison, P.R., Jones, R.M.H., Toome, D.W., Badger, S.E., Streater, M. and Pathirana, N.D.: Influence of flow-rate on the chromatographic performance of agarose- and cellulose-based anion-exchange media. *J. Chromatogr. A*, 734 (1996) 137-143.
- 3938 Willis, J.N., Dwyer, J.L., Liu, X. and Bourgeois, D.: (Reverse-phase and normal-phase chromatographic separations with LC-Transform Series 300 Interface). *Spectra Anal.*, 25 (1996) 31-34; C.A., 125 (1996) 25241s.
- See also 3863, 3874, 3876, 3878, 3881, 3882, 3883, 3884, 3990, 3994, 4016, 4237, 4238, 4296, 4308, 4323, 4327, 4481, 4700, 4768, 4832.

3f. Programmed temperature, pressure, vapors, gradients

- 3939 Dolan, J.W.: Problems with gradient methods. *LC-GC*, 14 (1996) 294-299; *C.A.*, 124 (1996) 305996y.
 3940 Kazoka, H. and Shatz, V.: Dynamically generated stationary liquid phase systems with silica and ternary mobile phases containing ethylene glycol and formamide. *J. Chromatogr. A*, 732 (1996) 231-238.

See also 3862, 3943, 3944, 4680.

4. SPECIAL TECHNIQUES**4a. Automation**

- 3941 McDowell, R.D.: "User" is a four-letter word. *LC-GC Int.*, 9 (1996) 404-407.

See also 4237, 4685, 4751.

4b. Computerization and modelling

- 3942 Benedetto, D.D. and Marchand, J.C.: (Ways to evaluate your integrating system for chromatography). *Spectra Anal.*, 24 (1995) 27-32; *C.A.*, 124 (1996) 277012d.
 3943 Cela, R. and Lores, M.: PREOPT-W: a simulation program for off-line optimization of binary gradient separations in HPLC-I. Fundamentals and overview. *Comput. Chem.*, 20 (1996) 175-191; *C.A.*, 124 (1996) 359531m.
 3944 Cela, R. and Lores, M.: PREOPT-W: a simulation program for off-line optimization of binary gradient separations in HPLC-II. Data management and miscellaneous aspects of use. *Comput. Chem.*, 20 (1996) 193-202; *C.A.*, 124 (1996) 359532n.
 3945 Gruber, J.: Advective transport of interacting solutes: The chromatographic model. In: Calmano, W. and Goerstner, U. (Editors), *Sediments Toxic Subst.*, Springer, Berlin, 1996, pp. 271-328; *C.A.*, 124 (1996) 351780w - a review with many refs.
 3946 Hinton, M., Hinton, P.R. and Williams, S.: Data acquisition for chromatography in the manufacturing environment. *Am. Lab. (Shelton)*, 28 (1996) 51-54; *C.A.*, 124 (1996) 277003b.
 3947 Jackson, C. and Yau, W.W.: Computer simulation study of size exclusion chromatography with simultaneous viscometry and light scattering measurements. *Polym. Mater. Sci. Eng.*, 69 (1993) 212-214; *C.A.*, 124 (1996) 290867f.
 3948 Janos, P.: Retention models for the ion chromatographic separations of metals in the presence of complexing agents. *J. Chromatogr. A*, 737 (1996) 129-138.
 3949 Kruglov, A.V., Bjorklund, M.C. and Carr, R.W.: Optimization of the simulated countercurrent moving-bed chromatographic reactor for the oxidative coupling of methane. *Chem. Eng. Sci.*, 51 (1996) 2954-2950; *C.A.*, 125 (1996) 14855u.
 3950 Lim, B.-G. and Ching, C.-B.: Modelling studies on the transient and steady state behavior of a simulated counter-current chromatographic system. *Sep. Technol.*, 6 (1996) 29-41; *C.A.*, 124 (1996) 264425r.
 3951 Mulholland, M., McKinnon, K. and Haddad, P.R.: Practical evaluation of ion chromatography methods developed by an expert system. *J. Chromatogr. A*, 739 (1996) 25-33.

- 3952 Mulholland, M., Preston, P., Hibbert, D.B., Haddad, P.R. and Compton, P.: Teaching a computer ion chromatography from a database of published methods. *J. Chromatogr. A*, 739 (1996) 15-24.
 3953 Roses, M., Bou, P., Bosch, E. and Siigur, K.: A new solvent parameter for prediction of retention on HPLC. *Org. React. (Tartu)*, 29 (1995) 51-53; *C.A.*, 124 (1996) 134342a.
 3954 Spatz, R.: (Multimedia HPLC for expert help). *LaborPraxis*, 20 (1996) 74-76; *C.A.*, 124 (1996) 359493a.

For additional information see *C.A.*:
 124 (1996) 331113c, 359231p.

See also 3857, 3864, 3869, 3883, 3885, 3927, 3976, 3980, 3999, 4292, 4295, 4525, 4527, 4697.

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

- 3955 Barjat, H., Morris, G.A., Newman, M.J. and Swanson, A.G.: Adaptation of commercial 500 MHz probes for LC/NMR. *J. Magn. Reson., Ser. A*, 119 (1996) 115-119; *C.A.*, 124 (1996) 283431f.
 3956 Cheung, P., Balke, S.T. and Schunk, T.C.: SEC-FTIR utilizing solvent evaporative interface. *Polym. Mater. Sci. Eng.*, 69 (1993) 122-123; *C.A.*, 124 (1996) 290727k.
 3957 Dai, S.-G. and Jia, C.-R.: Applications of hyphenated techniques in environmental analysis. *Anal. Sci.*, 12 (1996) 355-361; *C.A.*, 124 (1996) 281163w - a review with 56 refs.
 3958 McLean, M., Vestal, M.L., Teffera, Y. and Abramson, F.P.: Element- and isotope-specific detection for high-performance liquid chromatography using chemical reaction interface mass spectrometry. *J. Chromatogr. A*, 732 (1996) 189-199.
 3959 Pilard, S., Goarnisson, S., Poisson, X. and Luijten, W.: Applications of liquid chromatography/dynamic liquid secondary ion mass spectrometry in structural elucidation studies. *J. Mass Spectrom.*, Spec. Issue (1995) S85-S94; *C.A.*, 125 (1996) 9843j.
 3960 Suzuki, K.T.: Simultaneous speciation of endogenous and exogenous elements by HPLC/ICP-MS with enriched stable isotopes. *Tohoku J. Exp. Med.*, 178 (1996) 27-35; *C.A.*, 124 (1996) 336995b.
 3961 Yamada, K. and Matsutani, S.: Analysis of the dark-colored impurities in sulfonated fatty acid methyl ester. *J. Am. Oil Chem. Anal.*, 73 (1996) 121-126.

See also 3854, 3947, 4019, 4039, 4045, 4061, 4087, 4090, 4108, 4110, 4112, 4117, 4119, 4120, 4130, 4136, 4138, 4140, 4156, 4166, 4177, 4178, 4180, 4232, 4243, 4253, 4300, 4311, 4357, 4390, 4395, 4478, 4522, 4533, 4537, 4551, 4581, 4584, 4590, 4605, 4606, 4628, 4640, 4646, 4648, 4650, 4652, 4671, 4674, 4677, 4678, 4690, 4694, 4696, 4715, 4721, 4770, 4781, 4789, 4790, 4792, 4815, 4819, 4821, 4831, 4847, 4853, 4861, 4863, 4864, 4868, 4879, 4895, 4898, 4901, 4908, 4911, 4918, 4919, 4924, 4962.

4d. Affinity chromatography (advances)

- 3962 Cutler, P.: Affinity chromatography. *Methods Mol. Biol. (Totowa)*, 59(Protein Purification Protocols) (1996) 157-168; C.A., 125 (1996) 4616c - a review without refs.
- 3963 Evans, D.M., Williams, K.P., McGuinness, B., Tarr, G., Regnier, F., Afeyan, N. and Jindal, S.: Affinity-based screening of combinatorial libraries using automated serial-column chromatography. *Nat. Biotechnol.*, 14 (1996) 504-507; C.A., 125 (1996) 4694b.
- 3964 Gyepi-Garbrah, I., Eisenthal, R., Hubble, J. and Plant, A.: Approach to development of tentacle affinity matrixes. *Biochem. Soc. Trans.*, 24 (1996) 475; C.A., 124 (1996) 225411p.
- 3965 Jack, G.W. and Beer, D.J.: Immunoaffinity chromatography. *Methods Mol. Biol. (Totowa)*, 59(Protein Purification Protocols) (1996) 187-196; C.A., 125 (1996) 4619f - a review with 15 refs.
- 3966 Suen, S.-Y.: A comparison of isotherm and kinetic models for binary-solute adsorption to affinity membranes. *J. Chem. Technol. Biotechnol.*, 65 (1996) 249-257; C.A., 124 (1996) 224452r.
- 3967 West, I. and Goldring, O.: Lectin affinity chromatography. *Methods Mol. Biol. (Totowa)*, 59(Protein Purification Protocols) (1996) 177-185; C.A., 125 (1996) 4618e - a review with 32 refs.
- 3968 Worrall, D.M.: Dye-ligand affinity chromatography. *Methods Mol. Biol. (Totowa)*, 59(Protein Purification Protocols) (1996) 169-176; C.A., 125 (1996) 4617d - a review with 14 refs.
- 3969 Yip, T.-T. and Hutchens, T.W.: Immobilized metal ion affinity chromatography. *Methods Mol. Biol. (Totowa)*, 59(Protein Purification Protocols) (1996) 197-210; C.A., 125 (1996) 4699g.

For additional information see C.A.:
124 (1996) 229977a.

See also 4068, 4151, 4228, 4236, 4297, 4318, 4467, 4481, 4484, 4496, 4499, 4567.

4e. Functional analysis

See 4247, 4905.

4f. Trace analysis and preseparation techniques

- 3970 Langenfeld, J.J., Hawthorne, S.B. and Miller, D.J.: Optimizing split-splitless injection port parameters for solid-phase microextraction. *J. Chromatogr. A*, 740 (1996) 139-145.
- 3971 Neitzel, P.L., Ludwig, U., Nestler, W., Grischek, T. and Dehnert, J.: Ultrafiltration-an efficient cleanup tool for ion-pairing methods in liquid chromatography. *LC-GC*, 14 (1996) 416-424; C.A., 125 (1996) 25259d.
- 3972 Polesello, S.: (Preparation of samples for chromatographic analysis. Part 1. Extraction with solvents and solid-phase extraction (SPE)). *Lab. 2000*, 9 (1995) 36-44; C.A., 124 (1996) 277323f - a review with 7 refs.
- 3973 Sarzanini, C., Bruzzoniti, M.C., Sacchero, G. and Mentasti, E.: On-line preconcentration and separation of neutral and charged aromatic compounds by ion interaction chromatography. *J. Chromatogr. A*, 739 (1996) 63-70.

See also 3996, 4002, 4652, 4702, 4848, 4897, 4902, 4903, 4909, 4912, 4939.

4g. Enantiomers, separation

- 3974 Belov, Y.P., Aksinenko, A.Y., Blessington, B. and Newman, A.H.: Chiral aminophosphonate eluent for enantiomeric analysis of amino acids. *Chirality*, 8 (1996) 122-125; C.A., 124 (1996) 283372n.
- 3975 Chassaing, C., Thienpont, A. and Félix, G.: Regioselective carbamoylated and benzoylated cellulose for the separation of enantiomers in high-performance liquid chromatography. *J. Chromatogr. A*, 738 (1996) 157-167.
- 3976 Fornstedt, T., Zhong, G., Bensetiti, Z. and Guiochon, G.: Experimental and theoretical study of the adsorption behavior and mass transfer kinetics of propranolol enantiomers on cellulase protein as the selector. *Anal. Chem.*, 68 (1996) 2370-2378.
- 3977 Francotte, E. and Jung, M.: Enantiomer separation by open-tubular liquid chromatography and electrochromatography in cellulose-coated capillaries. *Chromatographia*, 42 (1996) 521-527.
- 3978 Galaverna, G., Corradini, R., Dossena, A., Marchelli, R. and Dal-lavalle, F.: Copper(II) complexes of N²-alkyl-(S)-amino acid amides as chiral selectors for dynamically coated chiral stationary phases in RP-HPLC. *Chirality*, 8 (1996) 189-196; C.A., 125 (1996) 11439a.
- 3979 Gilar, M., Uhrova, M. and Tesarova, E.: Enantiomer separation of dihydropyridine calcium antagonists with cyclodextrins as chiral selectors: structural correlation. *J. Chromatogr. B*, 681 (1996) 133-141.
- 3980 Hanai, T., Hatano, H., Nimura, N. and Kinoshita, T.: Computational chemical analysis of the separation of derivatized R- and S-amino acid enantiomers on N-(tert-butylaminocarbonyl)-(S)-valylaminopropylsilica gel and (R)-1-(α -naphthyl)-ethylaminocarbonyl-glycylaminopropylsilica gel by liquid chromatography. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1189-1204.
- 3981 Hyun, M.H., Na, M.S. and Min, C.-S.: Improved chiral stationary phase derived from (S)-naproxen for the liquid chromatographic resolution of enantiomers. *J. Chromatogr. A*, 732 (1996) 209-214.
- 3982 Maier, N.M. and Uray, G.: Diphenylethanediamine derivatives as chiral selectors. V. Efficient normal-phase high-performance liquid chromatographic enantioseparation of underivatized chiral arylalcohols on four differently linked 3,5-dinitrobenzoyldiphenylethanediamine-derived chiral stationary phases. *J. Chromatogr. A*, 732 (1996) 215-230.
- 3983 Sudo, Y., Yamaguchi, T. and Shinbo, T.: Preparation and enantioselectivity of (S)-binaphthol-bonded phase for high-performance liquid chromatography. *J. Chromatogr. A*, 736 (1996) 39-49.
- 3984 Wolf, C., Koenig, W.A. and Roussel, C.: Conversion of a racemate into a single enantiomer in one step by chiral liquid chromatography: studies with rac-2,2'-diiodobiphenyl. *Chirality*, 7 (1995) 610-611; C.A., 124 (1996) 231567k.
- 3985 Yashima, E., Yamamoto, C. and Okamoto, Y.: NMR studies of chiral discrimination relevant to the liquid chromatographic enantioseparation by a cellulose phenylcarbamate derivative. *J. Am. Chem. Soc.*, 118 (1996) 4036-4048; C.A., 124 (1996) 359518n.

For additional information see C.A.:

124 (1996) 306042w, 311798b, 317873u, 359525n.

See also 3919, 3920, 3925, 3926, 3932, 3950, 3989, 4083, 4176, 4207, 4528, 4555, 4562, 4619, 4699, 4707, 4709, 4728, 4739, 4752, 4768, 4782, 4791, 4820, 4833.

4h. Other special techniques

- 3986 Gündüz, U.: Evaluation of viscosities of polymer-water solutions used in aqueous two-phase systems. *J. Chromatogr. B*, 680 (1996) 263-266.
- 3987 Hernández, L.E., Rojas-Ojeda, P., Cooke, D.T. and Carpena-Ruiz, R.: Purification of pea nodule symbiosomes using an aqueous polymer two-phase system. *J. Chromatogr. B*, 680 (1996) 171-181.
- 3988 Lantz, P.-G., Tjerneld, F., Hahn-Hägerdal, B. and Rådström, P.: Use of aqueous two-phase systems in sample preparation for polymerase chain reaction-based detection of microorganisms. *J. Chromatogr. B*, 680 (1996) 165-170.
- 3989 Lim, B.-G. and Ching, C.-B.: Preliminary design of a simulated counter-current chromatographic system for the separation of praziquantel enantiomers. *J. Chromatogr. A*, 734 (1996) 247-258.
- 3990 Mazzotti, M., Kruglov, A., Neri, B., Gelosa, D. and Morbidelli, M.: A continuous chromatographic reactor: SMBR. *Chem. Eng. Sci.*, 51 (1996) 1827-1836; C.A., 125 (1996) 14026z.
- 3991 Pesek, J.J. and Matyska, M.T.: Separation of tetracyclines by high-performance capillary electrophoresis and capillary electrochromatography. *J. Chromatogr. A*, 736 (1996) 313-320.
- 3992 Sullins, D.W., Denton, T.T. and Eisenbraun, E.J.: Soxhlet apparatus and chromatography columns combined. *J. Chem. Educ.*, 73 (1996) 380-381; C.A., 124 (1996) 342094y.
- 3993 Van Lishout, Y.M.M. and Leighton, D.T., Jr.: Absorption-induced separations in oscillatory liquid chromatography. *AIChE J.*, 42 (1996) 940-952; C.A., 124 (1996) 264433s.
- 3994 Weisz, A., Scher, A.L. and Ito, Y.: Isolation of 4-bromo-4,5,6,7-tetrachlorofluorescein from a synthetic mixture by pH-zone-refining counter-current chromatography with continuous pH monitoring. *J. Chromatogr. A*, 732 (1996) 283-290.

See also 3872, 3904, 3917, 3925, 3998, 4051, 4086, 4291, 4294, 4299, 4304, 4307, 4334, 4341, 4365, 4372, 4398, 4399, 4400, 4401, 4424, 4523, 4541, 4686, 4688, 4693, 4700, 4832, 4854, 4881, 4882, 4883, 4884, 4885, 4886, 4915, 4916, 4917, 4960.

5. HYDROCARBONS AND HALOGEN DERIVATIVES

5b. Cyclic hydrocarbons, fullerenes

- 3995 De Voogt, P., Hinschberger, J., Maier, E.A., Grieping, B., Muntau, H. and Jacob, J.: Improvements in the determination of eight polycyclic aromatic hydrocarbons through a stepwise interlaboratory study approach. *Fresenius J. Anal. Chem.*, 356 (1996) 41-48.

3996 Järvenpää, E., Huopalahti, R. and Tapanainen, P.: Use of supercritical fluid extraction-high performance liquid chromatography in the determination of polynuclear aromatic hydrocarbons from smoked and broiled fish. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1473-1482.

3997 Kaupp, H. and Sklorz, M.: A method for analyzing polycyclic aromatic hydrocarbons (PAHS) in plant samples. *Chemosphere*, 32 (1996) 849-854; C.A., 124 (1996) 254931p.

3998 Marina, M.L., Kinanez, O., Garcia, M.A. and Vera, S.: Study of the separation selectivity of a group of benzene and naphthalene derivatives in micellar liquid chromatography. *Microchem. J.*, 53 (1996) 215-224; C.A., 124 (1996) 277382z.

3999 Podosenova, N.G.: (Peculiarities of fullerene adsorption chromatography). *Zh. Fiz. Khim.*, 70 (1996) 138-141; C.A., 124 (1996) 271365z.

4000 Scrivens, W.A., Bedworth, P.V. and Tour, J.M.: Purification of gram quantities of C60. A new inexpensive and facile method. *Report, Rept. No. TR-16; Order No. AD-A273299*, 1993, 8 pp.; C.A., 123 (1995) 245071k.

4001 Sirimanne, S.R., Barr, J.R., Patterson, D.G., Jr. and Ma, L.: Quantification of polycyclic aromatic hydrocarbons and polychlorinated dibenz-p-dioxins in human serum by combined micelle-mediated extraction (cloud-point extraction) and HPLC. *Anal. Chem.*, 68 (1996) 1556-1560.

4002 Ward Hills, J.W.: Sample preparation techniques for determining semi-volatile organic compounds in nuclear defense materials production waste. *J. Chromatogr. A*, 738 (1996) 215-224.

For additional information see C.A.:

125 (1996) 25299s.

See also 3936, 3973, 4015, 4843.

5c. Halogen derivatives

See 4001, 4643.

5d. Complex hydrocarbon mixtures (incl. analysis of tars, bitumens and mineral oils)

4003 Herod, A.A. and Kandiyoti, R.: Fractionation of coal tar pitch by planar chromatography for the characterization of large molecular mass materials. *J. Planar Chromatogr.*, 9 (1996) 16-24.

6. ALCOHOLS

4004 Dulfer, W.J., Groten, J.P. and Govers, H.A.J.: Effect of fatty acids and the aqueous diffusion barrier on the uptake and transport of polychlorinated biphenyls in caco-2 cells. *J. Lipid Res.*, 37 (1996) 950-961.

4005 Duque, M., Graupner, M., Stütz, H., Wicher, I., Zecher, R., Paltauf, F. and Hermetter, A.: New fluorogenic triacylglycerol analogs as substrates for the determination and chiral discrimination of lipase activities. *J. Lipid Res.*, 37 (1996) 868-876.

4006 Miszkiewicz, W. and Szymanowski, J.: Operational characteristics of the evaporative light scattering detector used in analysis of ethoxylated alcohols. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1013-1032.

See also 3925, 3982, 4834, 4837.

7. PHENOLS

- 4007 Bezrodnyj, V.P. and Lyashchuk, S.N.: (Diphenylolpropane dibenzenesulfonate as immobile liquid phase for separation of phenol and cresol isomers). *Russ. RU* 2,046,791 (CI. C07C309/73), 27 Oct. 1995, SU Appl. 5,049,405, 26 Jun. 1992; C.A., 125 (1996) 10367p.
- 4008 Di Corcia, A., Bellioni, A., Madbouly, M.D. and Marchese, S.: Trace determination of phenols in natural waters. Extraction by a new graphitized carbon black cartridge followed by liquid chromatography and re-analysis after phenol derivatization. *J. Chromatogr. A*, 733 (1996) 383-393.
- 4009 García Sánchez, F., Navas Díaz, A., Lovillo, J. and Feria, L.S.: α -Cyclodextrin as a restricted access mobile phase for reversed-phase liquid chromatography with fluorimetric detection of phenolic compounds. *Anal. Chim. Acta*, 328 (1996) 73-79.
- 4010 Goldberg, D.M., Tsang, E., Karumanchiv, A., Diamandis, E.P., Soleas, G. and Ng, E.: Method to assay concentrations of phenolic constituents of biological interest in wines. *Anal. Chem.*, 68 (1996) 1688-1694.
- 4011 Philo, M.R., Jickells, S.M. and Castle, L.: Testing for compliance with migration limits: determining of 1,2-, 1,3-, and 1,4-dihydroxybenzenes in food-stimulating solvents by liquid chromatography. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 746-750.
- 4012 Pocurull, E., Marcé, R.M. and Borrull, F.: Determination of phenolic compounds in natural waters by liquid chromatography with ultraviolet and electrochemical detection after on-line trace enrichment. *J. Chromatogr. A*, 738 (1996) 1-9.
- 4013 Puig, D. and Barceló, D.: Comparison of different sorbent materials for on-line liquid-solid extraction followed by liquid chromatographic determination of priority phenolic compounds in environmental waters. *J. Chromatogr. A*, 733 (1996) 371-381.
- 4014 Reighard, T.S. and Olesik, S.V.: Comparison of the extraction of phenolic and nitroaromatic pollutants using supercritical and enhanced-fluidity liquid methanol-CO₂ mixtures. *J. Chromatogr. A*, 737 (1996) 233-242.
- 4015 Shou, M. and Yang, S.K.: 3-Hydroxymethylcholanthrene: metabolic formation from 3-methylcholanthrene and stereoselective metabolism by rat liver microsomes. *Drug Metab. Disp.*, 24 (1996) 595-601.

For additional information see C.A.: 124 (1996) 277370u.

See also 3860, 3936, 3985, 4002, 4019, 4093, 4824, 4866.

8. SUBSTANCES CONTAINING HETERO CYCLIC OXYGEN

8a. Flavonoids

- 4016 Bucar, F., Schubert-Zsilavecz, M. and Knauder, E.: Flavonoids of *Guiera senegalensis*. *Pharmazie*, 51 (1996) 517-518.
- 4017 Franke, A.A. and Custer, L.J.: Daidzein and genistein concentrations in human milk after soy consumption. *Clin. Chem. (Washington)*, 42 (1996) 955-964.

- 4018 Gorski, K.M. and Barringer, G.E.: Flavonoids in beverages: photodiode array spectroscopic detection for chromatographic assays. *Am. Lab. (Shelton)*, 28 (1996) 98-99; C.A., 124 (1996) 287316v.

- 4019 Romani, A., Baldi, A., Mulinacci, N., Vincieri, F.F. and Tattini, M.: Extraction and identification procedures of polyphenolic compounds and carbohydrates in *Phillyrea (Phillyrea angustifolia L.)* leaves. *Chromatographia*, 42 (1996) 571-577.
- 4020 Zou, Y.: (Analysis of flavonoids in bamboo leaf by high-performance liquid chromatography). *Fenxi Huaxue*, 24 (1996) 216-219; C.A., 124 (1996) 225422t.

8b. Aflatoxins and other mycotoxins

- 4021 Brause, A.R., Trucksess, M.W., Thomas, F.S. and Page, S.W.: Determination of patulin in apple juice by liquid chromatography: collaborative study. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 451-455.
- 4022 De Sylos, C.M., Rodriguez-Amaya, D. and Pinto, C.A.P.A.: (Comparison of immunoassay and minicolumn chromatography for the screening of aflatoxins in peanut and corn). *Aliment. Nutr.*, 7 (1996) 7-14; C.A., 124 (1996) 287343b.
- 4023 Filek, G. and Lindner, W.: Determination of the mycotoxin moniliformin in cereals by high-performance liquid chromatography and fluorescence detection. *J. Chromatogr. A*, 732 (1996) 291-298.
- 4024 Kovacs, F., Sandor, G., Vanyi, A., Domany, S. and Zomborszky-Kovacs, F.: Detection of ochratoxin A in human blood and colostrum. *Acta Vet. Hung.*, 43 (1995) 393-400; C.A., 124 (1996) 281266g.
- 4025 Synderham, E.W., Shephard, G.S., Thiel, P.G., Stockenström, S. and Snijman, P.W.: Liquid chromatographic determination of fumonisins B₁, B₂, and B₃ in corn: AOAC-IUPAC collaborative study. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 688-696.

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

- 4026 Ddamba, W.A.A., Mokoena, T.T. and Keikothaile, B.M.: Gel permeation chromatographic separation characteristics of low molecular mass furfuryl alcohol oligomers. *Bull. Chem. Soc. Ethiop.*, 9 (1995) 93-99; C.A., 124 (1996) 344630u.
- 4027 Wang, T. and Yang, W.: Simultaneous determination of scopoletin and unbellerone in *Angelica pubescens* by RP-HPLC. *Fenxi Shiyanshi*, 15 (1996) 17-20; C.A., 125 (1996) 19148a.

See also 3919, 4001, 4545, 4584, 4643, 4662, 4666.

9. OXO COMPOUNDS, ETHERS, EPOXIDES AND QUINONES

- 4028 Nicoletti, I., Corradini, C., Cogliandro, E. and Corradini, D.: Identification and dosage of 2-furaldehyde and 5-hydroxymethyl-2-furaldehyde in beverages by reversed phase chromatography with a microbore column. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1241-1254.
- 4029 Ortiz, C.S. and Bertorello, M.M.: Applicability of an HPLC system in stability studies of a 4-isoxazolylamino-1,2-naphthoquinone. *Drug Stab.*, 1 (1996) 123-127; C.A., 124 (1996) 298697w.

- 4030 Pappas, P.W. and Wardrop, S.M.: Quantification of benzoquinones in the flour beetles, *Tribolium castaneum* and *Tribolium confusum*. *Prepar. Biochem. Biotechnol.*, 26 (1996) 53-66.
- 4031 Vinuelas Cobo, J.L., Rodriguez Roldan, A., Botas Rabasa, M. and Garcia-Moreno del Rio, C.: (Method for the determination of aldehydes in tuna). *Alimentaria (Madrid)*, 269 (1996) 67-68; C.A., 124 (1996) 287321t.

For additional information see C.A.:
124 (1996) 306043x.

See also 4559, 4815, 4835.

10. CARBOHYDRATES

10a. Mono and oligosaccharides. Structural studies

- 4032 Grard, T., Herman, V., Saint-Pol, A., Kmiecik, D., Labiau, O., Mir, A.-M., Alonso, C., Verbert, A., Cacan, R. and Michalski, J.-C.: Oligomannoside or oligosaccharide-lipid as potential substrates for rat liver cytosolic α -D-mannosidase. *Biochem. J.*, 316 (1996) 787-792.
- 4033 Ichiki, H., Semma, M., Sekiguchi, Y., Nakamura, M. and Ito, Y.: (Determination of sucralose in food by anion-exchange chromatography with pulsed amperometric detection). *Hippon Shokuhin Kagaku Gakkaishi*, 2 (1996) 119-121; C.A., 125 (1996) 8859g.
- 4034 Iwase, H., Tanaka, A., Hiki, Y., Kokubo, T., Ishii-Karakasa, I., Kobayashi, Y. and Hotta, K.: Abundance of Gal β 1,3GalNAc in O-linked oligosaccharide on hinge region of polymerized IgA1 and heat-aggregated IgA1 from normal human serum. *J. Biochem. (Tokyo)*, 120 (1996) 92-97.
- 4035 Kato, Y., Sato, R., Osawa, T., Takahata, J. and Kato, T.: (Determination of erythorbic acid and L-ascorbic acid in canned foods). *Sendai-shi Eisei Kenkyushocho*, 24 (1994, Pub. 1996) 109-111; C.A., 125 (1996) 8848c.
- 4036 Pauly, M., York, W.S., Guillen, R., Albersheim, P. and Darvill, A.G.: Improved protocol for the formation of N-(β -nitrobenzyl-oxy)aminoalitol derivatives of oligosaccharides. *Carbohydr. Res.*, 282 (1996) 1-12; C.A., 124 (1996) 317656a.
- 4037 Qiu, G., Toyoda, H., Toida, T., Koshiishi, I. and Imanari, T.: Compositional analysis of hyaluronan, chondroitin sulfate and dermatan sulfate: HPLC of disaccharides produced from the glycosaminoglycans by solvolysis. *Chem. Pharm. Bull.*, 44 (1996) 1017-1020.
- 4038 Ramusino, M.C., Dattilo, B.S., Lucibello, A. and Rossi, S.G.: Determination of 25 low molecular weight carbohydrates in tobacco by high performance ion chromatography. *Beitr. Tabakforsch. Int.*, 16 (1994) 77-84; C.A., 124 (1996) 283368r.
- 4039 Suzuki, S., Kakehi, K. and Honda, S.: Comparison of the sensitivities of various derivatives of oligosaccharides in LC/MS with fast atom bombardment and electrospray interface. *Anal. Chem.*, 68 (1996) 2073-2083.
- 4040 Tapsak, M.A., Wang, G.H., Azizian, K. and Weber, W.P.: Quantitative determination of completely acetylated pentaerythritol and pentaerythritol oligomers by high-performance liquid chromatography. *Anal. Chem.*, 68 (1996) 1685-1687.

- 4041 Wong, K.K.Y. and de Jong, E.: Size-exclusion chromatography of lignin- and carbohydrate-containing samples using alkaline eluents. *J. Chromatogr. A*, 737 (1996) 193-203.
- 4042 Yamauchi, S., Hanai, T., Suzuki, J., Ito, M., Sano, Y., Shibata, R., Kinoshita, T., Yaginuma, M., Kadowaki, K. and Takahashi, Y.: Development of protamine-bonded phase for separation of saccharides in liquid chromatography. *J. Chromatogr. A*, 737 (1996) 149-156.
- 4043 Yasui, T., Toda, C., Nagano, H. and Ishihara, H.: (Determination of oligosaccharides in foods for specified health use by HPLC). *Shokuhin Eiseigaku Zasshi*, 37 (1996) 29-37; C.A., 124 (1996) 341144c.

For additional information see C.A.:
124 (1996) 311801x, 320022w.

See also 3848, 3899, 4019, 4049, 4063, 4073, 4512, 4834.

10b. Polysaccharides, mucopolysaccharides, lipopolysaccharides

- 4044 Adachi, J. and Matsuno, R.: (Chromatographic separation of saccharoid). *New Food Ind.*, 38 (1996) 61-64; C.A., 124 (1996) 315211c - a review with 10 refs.
- 4045 Bahary, W., Hogan, M., Jilani, M. and Aronson, M.: Size exclusion chromatography of dextrans and pullulans with light scattering, viscosity and RI detection. *Polym. Mater. Sci. Eng.*, 69 (1993) 274-275; C.A., 124 (1996) 292770t.
- 4046 Bahary, W.S., Hogan, M.P., Jilani, M. and Aronson, M.P.: Size-exclusion chromatography of dextrans and pullulans with light-scattering, viscosity, and refractive index detection. *Adv. Chem. Ser.*, 247 (1995) 151-166; C.A., 123 (1995) 202708f.
- 4047 Campbell, M.A., Tester, A.M., Handley, C.J., Checkley, G.J., Chow, G.L., Cant, A.E., Winter, A.D. and Cain, W.E.: Characterization of a large chondroitin sulfate proteoglycan present in bovine collateral ligament. *Arch. Biochem. Biophys.*, 329 (1996) 181-190.
- 4048 Capron, I., Grisel, M. and Muller, G.: Online size exclusion chromatography and multiangle laser light scattering of high-molecular-weight rigid polysaccharides. *Int. J. Polym. Anal. Charact.*, 2 (1995) 9-20; C.A., 124 (1996) 290056r.
- 4049 Chai, W., Kogelberg, H. and Lawson, A.M.: Generation and structural characterization of a range of unmodified chondroitin sulfate oligosaccharide fragments. *Anal. Biochem.*, 237 (1996) 88-110z.
- 4050 Chazeau, L., Milas, M. and Rinaudo, M.: Conformations of xanthan in solution: analysis by steric exclusion chromatography. *Int. J. Polym. Anal. Charact.*, 2 (1995) 21-29; C.A., 124 (1996) 290067v.
- 4051 Franco, T.T., Rodrigues, N.R., Serra, G.E., Panegassi, V.R. and Buckeridge, M.S.: Characterization of storage cell wall polysaccharides from Brazilian legume seeds and the formation of aqueous two-phase systems. *J. Chromatogr. B*, 680 (1996) 255-261.
- 4052 Hall, I., Gillespie, D., Hammons, K. and Li, J.: Molecular weight and conformation of chitosan determined through SEC3 and stand alone light scattering and viscometry techniques. *Adv. Chitin Sci.*, 1 (1996) 361-371; C.A., 124 (1996) 320018z.

- 4053 Hanashiro, I., Abe, J. and Hizukuri, S.: A periodic distribution of the chain length of amylopectin as revealed by high-performance anion-exchange chromatography. *Carbohydr. Res.*, 283 (1996) 151-159; C.A., 124 (1996) 283393v.
- 4054 Hayashi, T., Hayashi, K., Maeda, M. and Kojima, I.: Calcium spirulan, an inhibitor of enveloped virus replication, from a blue-green alga *Spirulina platensis*. *J. Natural Prod.*, 59 (1996) 83-87.
- 4055 Kawase, M., Yoshida, Y. and Itakura, M.: (Chromatographic separation of sialic acid and its apparatus). *Jpn. Kokai Tokkyo Koho JP 08 73,483 [96 73,483] (Cl. C07H7/027)*, 19 Mar. 1996, Appl. 94/208,471, 1 Sep. 1994; 4 pp.; C.A., 125 (1996) 11372y.
- 4056 Mendichi, R., Audisio, G., Facino, R.M., Carini, M., Schieroni, A.G. and Saibene, L.: Use of size exclusion chromatography to study the protective effect of radical scavengers on oxygen free-radical-induced degradation of hyaluronic acid. *Int. J. Polym. Anal. Charact.*, 1 (1995) 365-371; C.A., 124 (1996) 249516c.
- 4057 Nagamine, T. and Komaee, K.: Improvement of a method for chain-length distribution analysis of wheat amylopectin. *J. Chromatogr. A*, 732 (1996) 255-259.
- 4058 Sechaud, R., Decosterd, L.A., Pechere-Bertschi, A., Biollaz, J. and Kesselring, U.W.: Determination of the polyfructosan sinistrin in biological fluids by HPLC with electrochemical detection. *J. Pharm. Biomed. Anal.*, 14 (1996) 483-490.
- 4059 Soltes, L., Mislovicova, D. and Sebille, B.: Insight into the distribution of molecular weights and higher-order structure of hyaluronans and some β -(1 \rightarrow 3)-glucans by size exclusion chromatography. *Biomed. Chromatogr.*, 10 (1996) 53-59; C.A., 124 (1996) 311484w.
- 4060 Stöcker, G., Drzeniek, Z., Just, U., Ostertag, W., Siebertz, B., Greiling, H. and Haubek, H.-D.: Proteoglycan synthesis in human and murine haematopoietic progenitor cell lines: isolation and characterization of a heparan sulphate proteoglycan as a major proteoglycan from the human haematopoietic cell line TF-1. *Biochem. J.*, 317 (1996) 203-212.
- 4061 Timpa, J.D.: Characterization by size exclusion chromatography with refractive index and viscometry: complex carbohydrates-cellulose, starch and plant cell wall polymers. *Polym. Mater. Sci. Eng.*, 69 (1993) 272-273; C.A., 124 (1996) 292763t - a review with 21 refs.
- For additional information see C.A.:
124 (1996) 311499e.
- See also 4064, 4512.
- 10c. Glycoproteins and their constituents
- 4062 Adams, L., Scott, G.K. and Weinberg, C.S.: Biphasic modulation of cell growth by recombinant human galectin-1. *Biochim. Biophys. Acta*, 1312 (1996) 137-144.
- 4063 Anumula, K.R.: Novel fluorescent methods for quantitative determination of monosaccharides and sialic acids in glycoproteins by reversed-phase high-performance liquid chromatography. In: Atassi, M.Z. and Appella, E. (Editors), *Methods Protein Struct. Anal. [Proc. Int. Conf.] 10th 1994*, Plenum, New York, 1995, pp. 195-206; C.A., 124 (1996) 225430u.
- 4064 Buckley, M.S., Washington, S., Laurent, C., Erickson, D.R. and Bhavanandan, V.P.: Characterization and immunohistochemical localization of the glycoconjugates of the rabbit bladder mucosa. *Arch. Biochem. Biophys.*, 330 (1996) 163-173.
- 4065 Chan, C.K.T. and Anastassiades, T.P.: Isolation and partial characterization of a high molecular weight anionic glycoconjugate from transforming growth factor- β treated bovine articular chondrocyte cultures. *Biochem. Cell Biol.*, 74 (1996) 233-240.
- 4066 Couto, L., Des Rosiers, P. and Sullivan, R.: Purification of P26h: a hamster sperm protein. *Biochem. Cell Biol.*, 74 (1996) 227-231.
- 4067 Feria, M., Pérez-Santiago, A., Cuevas, D., Martínez, M. and Coroba, F.: Purification and partial characterization of a new anti-A₁-lectin of *Phaseolus coccineus* collected in Oaxama, Mexico. *Prepar. Biochem. Biotechnol.*, 26 (1996) 31-46.
- 4068 Harmon, B.J., Gu, X. and Wang, D.I.C.: Rapid monitoring of site-specific glycosylation microheterogeneity of recombinant human interferon- γ . *Anal. Chem.*, 68 (1996) 1465-1473.
- 4069 Jacques, A.J., Opdenakker, G., Rademacher, T.W., Dwek, R.A. and Zamze, S.E.: The glycosylation of Bowes melanoma tissue plasminogen activator: lectin mapping, reaction with anti-L2/NHK-1 antibodies and the presence of sulphated/glucuronic acid containing glycans. *Biochem. J.*, 316 (1996) 427-437.
- 4070 Jumel, K., Fiebrig, I. and Harding, S.E.: Rapid size distribution and purity analysis of gastric mucus glycoproteins by size exclusion chromatography/multi-angle laser light scattering. *Int. J. Biol. Macromol.*, 18 (1996) 133-139; C.A., 124 (1996) 254923n.
- 4071 Kitazume, S., Kitajima, K., Inoue, S., Haslam, S.M., Morris, H.R., Dell, A., Lennarz, W.J. and Inoue, Y.: The occurrence of novel 9-O-sulfated N-glycolylneuraminic acid-capped α 2 \rightarrow 5-O-glycolyl-linked oligo/polyNeu5Gc chains in sea urchin egg cell surface glycoprotein. Identification of a new chain termination signal for polysialyltransferases. *J. Biol. Chem.*, 271 (1996) 6694-6701.
- 4072 Kröger, N., Bergsdorf, C. and Sumper, M.: Frustulins: domain conservation in a protein family associated with diatom cell walls. *Eur. J. Biochem.*, 239 (1996) 259-264.
- 4073 Makino, Y., Kuraya, N., Omichi, K. and Hase, S.: Classification of sugar chains of glycoproteins by analyzing reducing end oligosaccharides obtained by partial acid hydrolysis. *Anal. Biochem.*, 238 (1996) 54-59.
- 4074 Morag, E., Bayer, E.A. and Wilchek, M.: Reversibility of biotin-binding by selective modification of tyrosine in avidin. *Biochem. J.*, 316 (1996) 193-199.
- 4075 Nakazawa, K., Morita, A., Nakano, H., Mano, C. and Tozawa, N.: Keratan sulfate synthesis by corneal stromal cells within three-dimensional collagen gel cultures. *J. Biochem. (Tokyo)*, 120 (1996) 117-125.
- 4076 Rouse, J.C. and Vath, J.E.: On-the-probe sample cleanup strategies for glycoprotein-released carbohydrates prior to matrix-assisted laser desorption-ionization tissue-of-flight mass spectrometry. *Anal. Biochem.*, 238 (1996) 82-92.
- 4077 Townsend, R.R.: High-pH anion exchange chromatography of recombinant glycoprotein glycans. In: Katz, E.D. (Editor), *High Perform. Liq. Chromatogr.: Princ. Methods Biotechnol.*, Wiley, Chichester, 1996, pp. 381-412; C.A., 125 (1996) 4632e - a review with 61 refs.

- 4078 Tsuda, H., Yamada, S., Yamane, Y., Yoshida, K., Hopwood, J.J. and Sugahara, K.: Structures of five sulfated hexasaccharides prepared from porcine intestinal heparin using bacterial heparinase. Structural variants with apparent biosynthetic precursor-product relationships for the antithrombin III-binding site. *J. Biol. Chem.*, 271 (1996) 10495-1502.
- 4079 Winkler, U., Pickett, T.M. and Hudig, D.: Fractionation of perforin and granzymes by immobilized metal affinity chromatography (IMAC). *J. Immunol. Methods*, 191 (1996) 11-20; C.A., 125 (1996) 7730w.
- 4080 Wojczyk, B.S., Czerwinski, M., Stwora-Wojczyk, M.M., Siegel, D.L., Abrams, W.R., Wunner, W.H. and Spitalnik, S.L.: Purification of a secreted form of recombinant rabies virus glycoprotein: comparison of two affinity tags. *Protein Expression Purif.*, 7 (1996) 183-193; C.A., 124 (1996) 254922m.
- 4081 Yang, S.-X., Pollock, H.G. and Rawitch, A.B.: Glycosylation in human thyroglobulin: location of the N-linked oligosaccharide units and comparison with bovine thyroglobulin. *Arch. Biochem. Biophys.*, 327 (1996) 61-70.

See also 4253, 4268, 4332, 4441, 4734.

11. ORGANIC ACIDS AND LIPIDS

11a. Organic acids and simple esters

- 4082 Amet, Y., Berthou, F. and Menez, J.F.: Simultaneous radiometric and fluorimetric detection of lauric acid metabolites using high-performance liquid chromatography following esterification with 4-bromomethyl-6,7-dimethoxycoumarin in human and rat liver microsomes. *J. Chromatogr. B*, 681 (1996) 233-239.
- 4083 Booth, T.D. and Wainer, I.W.: Investigation of the enantioselective separations of α -alkylarylcarnoic acids on an amylose tris(3,5-dimethylphenylcarbamate) chiral stationary phase using quantitative structure-enantioselective retention relationships. Identification of a conformationally driven chiral recognition mechanism. *J. Chromatogr. A*, 737 (1996) 157-169.
- 4084 Caron, F., Elchuk, S. and Walker, Z.H.: High-performance liquid chromatographic characterization of dissolved organic matter from low-level radioactive waste leachates. *J. Chromatogr. A*, 739 (1996) 281-294.
- 4085 Chen, X.B., Pagella, J.H., Bakker, M.L. and Parra, O.: Determination of aromatic metabolites in ruminant urine by high-performance liquid chromatography. *J. Chromatogr. B*, 682 (1996) 201-208.
- 4086 Du, Q., Shu, A. and Ito, Y.: Purification of fish oil ethyl esters by high-speed countercurrent chromatography using non-aqueous solvent systems. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1451-1457.
- 4087 Duchateau, G.S.M.J.E., Oosten, H.J. and Vasconcellos, M.A.: Analysis of *cis*- and *trans*-fatty acid isomers in hydrogenated and refined vegetable oils by capillary gas-liquid chromatography. *J. Am. Oil Chem. Anal.*, 73 (1996) 275-282.
- 4088 Dutta, P.K., Robins, D.S. and Jakupca, M.: Dynamics of fatty acid chains in lithium aluminum layered double hydroxides. *Prepr.-Am. Chem. Soc., Div. Pet. Chem.*, 40 (1995) 257-258; C.A., 123 (1995) 266897z.
- 4089 Harwood, J.L.: Recent advances in the biosynthesis of plant fatty acids. *Biochim. Biophys. Acta*, 1301 (1996) 7-56 - a review with 579 refs.
- 4090 Itoh, M., Misaki, A. and Kominami, G.: Combined high-performance liquid chromatography and radioimmunoassay for a novel retinobenzoic acid derivative, 4-[(5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-2-naphthyl)-carbamoyl]benzoic acid (AM-80), in human plasma. *Anal. Lett.*, 29 (1996) 1377-1388.
- 4091 Juaneda, P.: Utilization of silver-ion high-performance liquid chromatography for separation of the geometrical isomers of α -linolenic acid. In: Sebedio, J.-L. and Perkins, E.G. (Editors), *New Trends Lipid Lipoprotein Anal., [Proc. Int. Symp.] 1993*, AOCS Press, Champaign, 1995, pp. 75-80; C.A., 125 (1996) 8909y.
- 4092 Krumbein, A.: (Ion chromatographic methods for the determination of taste transmitter fruit acids in tomatoes). *Geschmacksstoffe Pflanz. Nahrungsm.-Dtsch. Ges. Qualitaetsforsch.*, 30th 1995, Deutsche Gesellschaft fuer Qualitaetsforschung, Freising, 1995, pp. 282-287; C.A., 124 (1996) 315260t.
- 4093 Krzaczek, T., Bogucka-Kocka, A. and Snieszko, R.: Phenolic acids of some species of the *Oenothera* L. genus. *Acta Soc. Bot. Pol.*, 64 (1996) 41-44; C.A., 124 (1996) 336991x.
- 4094 Laethem, R.M., Balazy, M. and Koop, D.R.: Epoxidation of C_{18} unsaturated fatty acids by cytochromes P4502C2 and P4502CAA. *Drug Metab. Disp.*, 24 (1996) 664-668.
- 4095 Marcato, B., Paganetto, G., Ferrara, G. and Cecchin, G.: High-performance liquid chromatographic determination of some of the hydrolytic decomposition products of poly(α -hydroxyacid)s. *J. Chromatogr. B*, 682 (1996) 147-156.
- 4096 Miwa, H. and Yamamoto, M.: Assay of volatile acids induced by autoxidation of nonionic surfactants by liquid chromatography with direct derivatization. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 418-422.
- 4097 Miwa, H. and Yamamoto, M.: Rapid liquid chromatographic determination of fatty acids as 2-nitrophenylhydrazine derivatives. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 493-497.
- 4098 Mongay, C., Pastor, A. and Olmos, C.: Determination of carboxylic acids and inorganic anions in wines by ion-exchange chromatography. *J. Chromatogr. A*, 736 (1996) 351-357.
- 4099 Obertreis, B., Giller, K., Teucher, T., Behnke, B. and Schmitz, H.: Antiphlogistische Effekte von Extractum Urticae dioicae foliorum im Vergleich zu Kaffeoylepläflesäure. *Arzneim.-Forsch.*, 46 (1996) 52-56.
- 4100 Ohta, K., Tanaka, K. and Haddad, P.R.: Ion-exclusion chromatography of aliphatic carboxylic acids on an unmodified silica gel column. *J. Chromatogr. A*, 739 (1996) 359-365.
- 4101 Rayl, E.A., Green, J.M. and Nichols, B.P.: *Escherichia coli* amideoxychorismate synthase: analysis of pabB mutations affecting catalysis and subunit association. *Biochim. Biophys. Acta*, 1295 (1996) 81-88.
- 4102 Rieger, C.E. and Turnbull, J.L.: Small scale biosynthesis and purification of gram quantities of chorismic acid. *Prepar. Biochem. Biotechnol.*, 26 (1996) 67-76.
- 4103 Saitanu, K., Kobayashi, H., Chalermaikit, T. and Kondo, F.: Simple and rapid method for determination of oxolinic acid in tiger shrimp (*Penaeus monodon*) by high-performance liquid chromatography. *J. Food Prot.*, 59 (1996) 199-201; C.A., 124 (1996) 315263w.

- 4104 Schmider, W., Fahr, A., Voges, R., Gerok, W. and Kurz, G.: Irreversible inhibition of hepatic fatty acid salt uptake by photoaffinity labeling with 11,11-azistearate. *J. Lipid Res.*, 37 (1996) 739-753.
- 4105 Sparreboom, A., van Tellingen, O., Huizing, M.T., Nooijen, W.J. and Beijnen, J.H.: Determination of polyoxyethyleneglycerol triricinoleate 35 (Cremophor EL) in plasma by pre-column derivatization and reversed-phase high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 355-362.
- 4106 Ternes, W. and Schwarz, K.: Antioxidative constituents of *Rosmarinus officinalis* and *Salvia officinalis*. Part 4. Determination of carnosic acid in different foodstuffs. *Z. Lebensm.-Unters. Forsch.*, 201 (1995) 548-550; C.A., 124 (1996) 315236q.
- 4107 Ushijima, T., Saito, M., Sasamoto, K., Ohkura, Y. and Ueno, K.: Sensitive and mild fluorogenic reagents for biogenic carboxylic acids in HPLC. *Anal. Sci. Technol.*, 8 (1995) 545-551; C.A., 124 (1996) 283378u.
- 4108 Wolff, R.L., Nour, M. and Bayard, C.C.: Participation of the *cis*-12 ethylenic bond to *cis-trans* isomerization of the *cis*-9 and *cis*-15 ethylenic bonds in heated α -linolenic acid. *J. Am. Oil Chem. Anal.*, 73 (1996) 327-332.

For additional information see C.A.:

- 124 (1996) 258778s, 277408n;
125 (1996) 25321t.

See also 3910, 4009, 4126, 4188, 4208, 4222, 4746, 4824, 4833, 4834, 4932, 4949.

11b. Prostaglandins

- 4109 Fulton, D., Balazy, M., McGiff, J.C. and Quillie, J.: Possible contribution of platelet cyclooxygenase to the renal vascular action of 5,6-epoxyeicosatrienoic acid. *J. Pharmacol. Exp. Ther.*, 277 (1996) 1195-1199.
- 4110 Waugh, R.J. and Murphy, R.C.: Mass spectrometric analysis of four regioisomers of F₂-isoprostanes formed by free radical oxidation of arachidonic acid. *J. Am. Soc. Mass Spectrom.*, 7 (1996) 490-499; C.A., 125 (1996) 1589k.

See also 4877.

11c. Lipids and their constituents

- 4111 Abidi, S.L., Mounts, T.L. and Finn, T.: A preferred solvent system for high-performance liquid chromatographic analysis of soybean phospholipids with evaporative light-scattering detection. *J. Am. Oil Chem. Anal.*, 73 (1996) 535-538.
- 4112 Al-Rashood, K.A., Abou-Shaab, R.R.A., Abdel-Moety, E.M. and Rauf, A.: Compositional and thermal characterization of genuine and randomized lacl: a comparative study. *J. Am. Oil Chem. Anal.*, 73 (1996) 303-309.
- 4113 Arduini, A., Pescechera, A., Dottori, S., Sciarroni, A.F., Serafini, F. and Calvani, M.: High performance liquid chromatography of long-chain acylcarnitine and phospholipids and fatty acid turnover studies. *J. Lipid Res.*, 37 (1996) 684-689.

- 4114 Arnoldsson, K.C. and Olsson, N.U.: Analysis of polar lipids with HPLC and light-scattering detection. In: Cevc, G. and Paltauf, F. (Editors), *Phospholipids: Charact., Metab., Novel Biol. Appl., Proc. Int. Colloq., 6th* 1993, AOCS Press, Champaign, 1995, pp. 44-55; C.A., 124 (1996) 311502a.
- 4115 Balazs, P.E., Schmit, P.L. and Szuhaj, B.F.: High-performance liquid chromatographic separations of soy phospholipids. *J. Am. Oil Chem. Anal.*, 73 (1996) 193-197.
- 4116 Bergqvist, M.H.J.: Chromatographic resolution of partially perdeuterated diglucosyldiacylglycerols from *Acholeplasma laidlawii*. *J. Chromatogr. A*, 736 (1996) 83-89.
- 4117 Bergqvist, M.H.J. and Kaufmann, P.: Analysis of cereal digalactosyldiacylglycerol molecular species by high-performance liquid chromatography. *J. Am. Oil Chem. Anal.*, 73 (1996) 211-217.
- 4118 Bouustro, J.A. and Gooris, G.S.: Phase behavior of isolated skin lipids. *J. Lipid Res.*, 37 (1996) 999-1011.
- 4119 Careri, M., Dieci, M., Mangia, A., Manini, P. and Raffaelli, A.: Liquid chromatography/mass spectrometry of phospholipids in soybean products using particle beam and ion-spray interfaces. *Rapid Commun. Mass Spectrom.*, 10 (1996) 707-714; C.A., 124 (1996) 341218e.
- 4120 Chang, M.K., Conkerton, E.J., Chapital, D.C., Wan, P.J., Vadhwa, O.P. and Spiers, J.M.: Chines melon (*Momordica charantia* L.) seed composition and potential use. *J. Am. Oil Chem. Anal.*, 73 (1996) 263-265.
- 4121 Christie, W.W.: Lipid class separations using high-performance liquid chromatography. In: Sebedio, J.-L. and Perkins, E.G. (Editors), *New Trends Lipid Lipoprotein Anal., [Proc. Int. Symp.] 1993*, AOCS Press, Champaign, 1995, pp. 45-58; C.A., 124 (1996) 311435f - a review with 47 refs.
- 4122 Dobarganes, M.C. and Marquez-Ruiz, G.: High-performance size-exclusion chromatography applied to the analysis of edible fats. In: Sebedio, J.-L. and Perkins, E.G. (Editors), *New Trends Lipid Lipoprotein Anal., [Proc. Int. Symp.] 1993*, AOCS Press, Champaign, 1995, pp. 81-92; C.A., 124 (1996) 341142a.
- 4123 Elsner, A. and Lange, R.: Separation of phospholipids in macro-scale by ion-exchange chromatography. In: Cevc, G. and Paltauf, F. (Editors), *Phospholipids: Charact., Metab., Novel Biol. Appl., Proc. Int. Colloq., 6th* 1993, AOCS Press, Champaign, 1995, pp. 363-371; C.A., 124 (1996) 311503b.
- 4124 Fisher, A.B. and Dodia, C.: Role of phospholipase A₂ enzymes in degradation of dipalmitoylphosphatidyl choline by granular pneumocytes. *J. Lipid Res.*, 37 (1996) 1057-1064.
- 4125 Gasser, H., Hallstroem, S., Redl, H. and Schlag, G.: Oxidatively modified plasma phospholipids containing reactive carbonyl functions measured by HPLC: evidence for phosphatidylcholine-bound aldehydes in plasma of burn patients. *Free Radical Res.*, 22 (1995) 327-336; C.A., 124 (1996) 336972s.
- 4126 Gonzales-Castro, M.J., Lopez-Hernandez, J., Simal-Lozano, J., Oruna-Concha, M.J. and Vazquez-Blanco, M.E.: Separation of neutral lipid classes in green beans by high-performance liquid chromatography. *J. Chromatogr. Sci.*, 34 (1996) 199-201.
- 4127 Han, X., Gubitsi-Klug, R.A., Collins, B.J. and Gross, R.W.: Alterations in individual molecular species of human platelet phospholipids during thrombin stimulation: electrospray ionization mass spectrometry-facilitated identification of the boundary conditions for the magnitude and selectivity of thrombin-induced platelet phospholipid hydrolysis. *Biochemistry*, 35 (1996) 5822-5832.

- 4128 Hayes, D.G. and Kleiman, R.: A detailed triglyceride analysis of *Lesquerella fendleri* oil: chromatographic fractionation followed by supercritical fluid chromatography. *J. Am. Oil Chem. Anal.*, 73 (1996) 267-269.
- 4129 Heron, S., Bleton, J. and Tchapla, A.: Mechanism for separation of triacylglycerols in oils by liquid chromatography: identification by mass spectrometry. In: Sebedio, J.-L. and Perkins, E.G. (Editors), *New Trends Lipid Lipoprotein Anal.*, [Proc. Int. Symp.J 1993], AOCS Press, Champaign, 1995, pp. 205-231; C.A., 124 (1996) 315226m - a review with 59 refs.
- 4130 Huang, K.H. and Akoh, C.C.: Enzymatic synthesis of structured lipids: transesterification of triolein and caprylic acid ethyl ester. *J. Am. Oil Chem. Anal.*, 73 (1996) 245-256.
- 4131 Kaufmann, P. and Hersloef, B.G.: Assessment of lipid oxidative stability by chromatography and chemometrics. In: Cevc, G. and Paltauf, F. (Editors), *Phospholipids: Charact., Metab., Novel Biol. Appl.*, Proc. Int. Colloq., 6th 1993, AOCS Press, Champaign, 1995, pp. 33-43; C.A., 125 (1996) 5000.
- 4132 Khoo, K., Chatterjee, D., Dell, A., Morris, H.R., Brennan, P.J. and Draper, P.: Novel O-methylated terminal glucuronic acid characterizes the polar glycopeptidolipids of *Mycobacterium habana* strain TMC 5135. *J. Biol. Chem.*, 271 (1996) 12333-12342.
- 4133 Murphy, E.J., Prows, D.R., Jefferson, J.R. and Schroeder, F.: Liver fatty acid-binding protein expression in transfected fibroblasts stimulates fatty acid uptake and metabolism. *Biochim. Biophys. Acta*, 1301 (1996) 191-198.
- 4134 Nara, K., Watanabe, Y., Kawashima, I., Tai, Y., Nagai, Y. and Sanai, Y.: Acceptor substrate specificity of a cloned G_{03} synthase that catalyzes the biosynthesis of both G_{03} and $G_{01}/G_{13}/G_{01b}$. *Eur. J. Biochem.*, 238 (1996) 647-652.
- 4135 Olsson, N.U., Harding, A.J., Harper, C. and Salem, N., Jr.: High-performance liquid chromatography method with light-scattering detection for measurements of lipid class composition: analysis of brains from alcoholics. *J. Chromatogr. B*, 681 (1996) 213-218.
- 4136 Raman, L.P., Cherya, M. and Rajagopalan, N.: Deacidification of soybean oil by membrane technology. *J. Am. Oil Chem. Anal.*, 73 (1996) 219-224.
- 4137 Redden, P.R., Lin, X. and Horrobin, D.F.: Comparison of the Grignard deacetylation TLC and HPLC methods and high resolution ^{13}C -NMR for the sn-2 positional analysis of triacylglycerols containing γ -linolenic acid. *Chem. Phys. Lipids*, 79 (1996) 9-19; C.A., 124 (1996) 225718u.
- 4138 Rizea Savu, S., Silvestro, L., Sörgel, F., Montruccchio, G., Lupia, E. and Camussi, G.: Determination of 1-O-acyl-2-acetyl-sn-glyceryl-3-phosphorylcholine, platelet-activating factor and related phospholipids in biological samples by high-performance liquid chromatography-tandem mass spectrometry. *J. Chromatogr. B*, 682 (1996) 35-45.
- 4139 Robins, S.J., Fasulo, J.M., Pritzker, C.R. and Patton, G.M.: Hepatic transport and secretion of unesterified cholesterol in the rat is traced by the plant sterol sitostanol. *J. Lipid Res.*, 37 (1996) 15-21.
- 4140 Ruiz-Sala, P., Hierro, M.T.G., Martinez-Castro, I. and Santa-Maria, G.: Triglyceride composition of ewe, cow and goat milk fat. *J. Am. Oil Chem. Anal.*, 73 (1996) 283-293.
- 4141 Subbaiah, P.V. and Liu, M.: Comparative studies the substrate specificity of lecithin-cholesterol acyltransferase towards the molecular species of phosphatidylcholine in the plasma of 14 vertebrates. *J. Lipid Res.*, 37 (1996) 113-122.
- 4142 Subbaiah, P.V. and Liu, M.: Disparate effects of oxidation on plasma acyltransferase activities: inhibition of cholesterol esterification but stimulation of transesterification of oxidized phospholipids. *Biochim. Biophys. Acta*, 1301 (1996) 115-126.
- 4143 Szucs, R., Verleysen, K., Duchateau, G.S.M.J.E., Sandra, P. and Vandeginste, B.G.M.: Analysis of phospholipids in lecithins. Comparison between micellar electrokinetic chromatography and high-performance liquid chromatography. *J. Chromatogr. A*, 738 (1996) 25-29.
- 4144 Uhrig, M.L., Couto, A.S., Colli, W. and de Ledekerremer, R.M.: Characterization of inositolphospholipids in *Trypanosoma cruzi* trypomastigote forms. *Biochim. Biophys. Acta*, 1300 (1996) 233-239.
- 4145 VanRollins, M., Kaduce, T.L., Fang, X., Knapp, H.R. and Spector, A.A.: Arachidonic acid diols produced by cytochrome P-450 monooxygenases are incorporated into phospholipids of vascular endothelial cells. *J. Biol. Chem.*, 271 (1996) 14001-14009.
- See also 3902, 3907, 4105, 4576.
- 11d. Lipoproteins and their constituents**
- 4146 Barter, P.J.: Size exclusion chromatography applied to the analysis of lipoproteins. In: Sebedio, J.-L. and Perkins, E.G. (Editors), *New Trends Lipid Lipoprotein Anal.*, [Proc. Int. Symp.J, 1993], AOCS Press, Champaign, 1995, pp. 337-346; C.A., 124 (1996) 336923b.
- 4147 Connelly, P.W., Vezina, C. and Maguire, G.F.: Quantification of apolipoprotein C-II by immunochemical and chromatographic methods. *Methods Enzymol.*, 263(Plasma Lipoproteins, Part C) (1996) 188-208; C.A., 124 (1996) 254833h - a review with 30 refs.
- 4148 Demoor, L., Boutillon, C., Fievet, C., Vanloo, B., Baert, J., Rosseneu, M., Fruchart, J.-C. and Tartar, A.: Branched synthetic constructs that mimic the physico-chemical properties of apolipoprotein AI in reconstituted high-density lipoproteins. *Eur. J. Biochem.*, 239 (1996) 74-84.
- 4149 Fless, G.M. and Snyder, M.L.: Quantitation of lipoprotein(a) after lysine-Sepharose chromatography and density gradient centrifugation. *Methods Enzymol.*, 263(Plasma Lipoproteins, Part C) (1996) 238-251; C.A., 124 (1996) 311707w.
- 4150 Gambino, R., Ruiu, G., Gassader, M. and Pagano, G.: Apolipoprotein H: a two-step isolation method. *J. Lipid Res.*, 37 (1996) 902-904.
- 4151 Lippi, G., Io Cascio, C., Ruzzennente, O., Poli, G., Brentegani, C. and Guidi, G.: Simple and rapid procedure for the purification of lipoprotein(a). *J. Chromatogr. B*, 682 (1996) 225-231.
- 4152 Sorci-Thomas, M.G., Parks, J.S., Kearns, M.W., Pate, G.N., Zhang, C. and Thomas, M.J.: High level secretion of wild-type and mutant forms of human proapo-a-I using baculovirus-mediated SF-9 cell expression. *J. Lipid Res.*, 37 (1996) 673-683.
- 4153 Sparks, J.D. and Sparks, C.E.: Chromatographic method for isolation and quantification of apolipoproteins B-100 and B-48. *Methods Enzymol.*, 263(Plasma Lipoproteins, Part C) (1996) 104-120; C.A., 124 (1996) 283394w.
- See also 4353.

13. STEROIDS

13a. General techniques

- 4154 Giraudi, G. and Baggiani, C.: Strategy for fractionating high-affinity antibodies to steroid hormones by affinity chromatography. *Analyst (Cambridge)*, 121 (1996) 939-944.
- 4155 Kominami, S., Nishida, N. and Takemori, S.: Reconstitution of the steroidogenic pathway from cholesterol to aldosterone in liposome membranes. *Biochim. Biophys. Acta*, 1301 (1996) 199-206.
- 4156 Murray, S., Rendell, N.B. and Taylor, G.W.: Microbore high-performance liquid chromatography-electrospray ionisation mass spectrometry of steroid sulphates. *J. Chromatogr. A*, 738 (1996) 191-199.

For additional information see C.A.:
124 (1996) 279356t.

13b. Pregnane and androstane derivatives

- 4157 Brunner, L.J., Bennett, W.M. and Koop, D.R.: Selective suppression of rat hepatic microsomal activity during chronic cyclosporine nephrotoxicity. *J. Pharmacol. Exp. Ther.*, 277 (1996) 1710-1718.
- 4158 Döppenschmitt, S.A., Scheidel, B., Harrison, F. and Surmann, J.P.: Simultaneous determination of triamcinolone acetonide and hydrocortisone in human plasma by high-performance liquid chromatography. *J. Chromatogr. B*, 682 (1996) 79-88.
- 4159 Gentile, D.M., Tomlinson, E.S., Maggs, J.L., Park, B.K. and Back, D.J.: Dexamethasone metabolism by human liver *in vitro*. Metabolite identification and inhibition of 6-hydroxylation. *J. Pharmacol. Exp. Ther.*, 277 (1996) 105-112.
- 4160 McWhinney, B.S., Ward, G. and Hickman, P.E.: Improved HPLC method for simultaneous analysis of cortisol, 11-deoxycortisol, prednisolone, methylprednisolone, and dexamethasone in serum and urine. *Clin. Chem. (Washington)*, 42 (1996) 979-981.

13c. Estrogens

- 4161 Novakovic, J., Pacakova, V., Sevcik, J. and Cserhati, T.: Quantitative structure-chromatographic retention relationship study of six underivatized equine estrogens. *J. Chromatogr. B*, 681 (1996) 115-123.

13d. Sterols

- 4162 Axelson, M. and Larsson, O.: 27-Hydroxylated low density lipoprotein (LDL) cholesterol can be converted to 7 α ,27-dihydroxy-4-cholesten-3-one (cytosterone) before suppressing cholesterol production in normal human fibroblast. Evidence that an altered metabolism of LDL cholesterol can underline a defective feedback control in malignant cells. *J. Biol. Chem.*, 271 (1996) 12724-12736.
- 4163 Del Nozal, M.J., Bernal, J.L. and Marinero, P.: Simultaneous HPLC determination of cholesterol, α -tocopherol, retinol, retinal and retinoic acid in silicone oils used as vitreous substitutes in eye surgery. *J. Liq. Chromatogr. Ref. Technol.*, 19 (1996) 1151-1167.

- 4164 Korytowski, W., Geiger, P.G. and Girotti, A.W.: Enzymatic reducibility in relation to cytotoxicity for various cholesterol hydroperoxides. *Biochemistry*, 35 (1996) 8670-8679.

- 4165 Maraschello, C., Diaz, I. and Garcia Regueiro, J.A.: Determination of cholesterol in fat and muscle of pig by HPLC and capillary gas chromatography with solvent venting injection. *J. High Resolut. Chromatogr.*, 19 (1996) 165-168.

See also 4139.

13e. Bile acids and alcohols

- 4166 Schwab, D., Thom, H., Heinze, J. and Kurz, G.: 3 α ,7 α ,12 α -Trihydroxy-24-nor5 β -cholan-23-sulfonate: Synthesis and suitability for the study of cholate transport. *J. Lipid Res.*, 37 (1996) 1045-1056.
- 4167 Une, M., Harada, J.-i., Mikami, T. and Hoshita, T.: High-performance liquid chromatographic separation of ultraviolet-absorbing bile alcohol derivatives. *J. Chromatogr. B*, 682 (1996) 157-161.

For additional information see C.A.:
124 (1996) 225393j.

See also 4156, 4805.

13g. Other steroids

- 4168 Iwata, J., Morita, H., Yasuda, K., Kuwayama, A., Suzuki, T. and Demura, H.: Daily excretion levels of an unidentified ketosteroid in the urine of patients with Cushing's syndrome and healthy subjects measured by a new method. *Endocr. J. (Tokyo)*, 42 (1995) 449-453; C.A., 124 (1996) 254906j.

For additional information see C.A.:
124 (1996) 311725a.

14. STEROID GLYCOSIDES AND SAPONINS

- 4169 Belsner, K. and Büchele, B.: Fluorescence detection of cardenolides in reversed-phase high-performance liquid chromatography after post-column derivatization. *J. Chromatogr. B*, 682 (1996) 95-107.
- 4170 Park, M.K., Park, J.H., Han, S.B., Shin, Y.G., Il, H.P.: High-performance liquid chromatographic analysis of ginseng saponins using evaporative light scattering detection. *J. Chromatogr. A*, 736 (1996) 77-81.
- 4171 Piacente, S., Pizza, C., de Tommasi, N. and Mahnood, N.: Constituents of *Ardisia japonica* and their *in vitro* anti-HIV activity. *J. Natural Prod.*, 59 (1996) 565-569.
- 4172 Qazzaz, H.M.A.M., Goudy, S.L. and Valdes, R., Jr.: Deglycosylated products of endogenous digoxin-like immunoreactive factor in mammalian tissue. *J. Biol. Chem.*, 271 (1996) 8731-8737.
- 4173 Qazzaz, H.M.A.M., Jortani, S.A., Poole, J.M. and Valdes, R., Jr.: Evidence for presence of a reduced form of digoxin-like immunoreactive factor (dihydro-DLF) in mammalian tissues. *Clin. Chem. (Washington)*, 42 (1996) 1092-1099.

15. TERPENES AND OTHER VOLATILE AROMATIC COMPOUNDS

15a. Terpenes

- 4174 Bicchi, C., Rubiolo, P., Fresia, M., David, F. and Sandra, P.: Analysis of constituents of Iris rhizomes. Part III - packed column supercritical fluid chromatography and high pressure liquid chromatography of iridale from rhizomes of *Iris pallida* L. *Phytochem. Anal.*, 7 (1996) 37-41; C.A., 124 (1996) 225398q.
- 4175 Brown, A.M.G., Lowe, K.C., Davey, M.R., Power, J.B., Knight, D.W. and Heptinstall, S.: Comparison of extraction procedures for parthenolide in *Tanacetum parthenium*. *Phytochem. Anal.*, 7 (1996) 86-91; C.A., 124 (1996) 254930n.
- 4176 Moeder, C., O'Brien, T., Thompson, R. and Bicker, G.: Determination of stoichiometric coefficients and apparent formation constants for α - and β -CD complexes of terpenes using reversed-phase liquid chromatography. *J. Chromatogr. A*, 736 (1996) 1-9.
- 4177 Poon, G.K., Vigushin, D., Griggs, L.J., Rowlands, M.G., Coombes, R.C. and Jarman, M.: Identification and characterization of limonene metabolites in patients with advanced cancer by liquid chromatography/mass spectrometry. *Drug Metab. Disp.*, 24 (1996) 565-571.
- 4178 Richheimer, S.L., Bernart, M.W., King, G.A., Kent, K.M. and Bailey, D.T.: Antioxidant activity of lipid-soluble phenolic diterpenes from rosemary. *J. Am. Oil Chem. Anal.*, 73 (1996) 507-514.
- 4179 Yoshikawa, M., Yoshizumi, S., Murakami, T., Matsuda, H., Yamahara, J. and Murakami, N.: Medicinal foodstuffs. II. On the bioactive constituents of the tuber of *Sagittaria trifolia* L. (Kuwai, Alismataceae): absolute stereostructures of trifoliones A, B, C, and D, sagittariosides a and b, and arabinothalictoside. *Chem. Pharm. Bull.*, 44 (1996) 492-499.

See also 4171, 4837.

15b. Essential oils

See 4837.

15c. Bitter substances

- 4180 Höltzel, A., Schlotterbeck, G., Albert, K. and Bayer, E.: Separation and characterisation of hop bitter acids by HPLC- ^1H NMR coupling. *Chromatographia*, 42 (1996) 499-505.

16. NITRO AND NITROSO COMPOUNDS

- 4181 Gawdzik, B. and Matynia, T.: Use of porous polymers in off-line preconcentration of nitrobenzenes and their reduction products from water. *J. Chromatogr. A*, 733 (1996) 491-496.
- 4182 Hayakawa, K. and Miyazaki, M.: Determination of mutagenic nitroarenes in urban air by high-performance liquid chromatography with chemiluminescence detection. In: Campbell, A.K., Kricka, L.J. and Stanley, P.E. (Editors), *Biolumin. Chemilumin. Proc. Int. Symp.*, 8th, Wiley, Chichester, 1994, pp. 72-75; C.A., 124 (1996) 350937r.

For additional information see C.A.:
125 (1996) 25304q.

See also 4014, 4651, 4819, 4850, 4855.

17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

17a. Amines and polyamines

- 4183 Anonymous: Amine recovery using continuous ion-exchange. *Res. Disc.*, 383 (1996) 206; C.A., 124 (1996) 264415n.
- 4184 DeBoer, P. and Abercrombie, E.D.: Physiological release of striatal acetylcholine *in vivo*: modulation by D1 and D2 dopamine receptor subtypes. *J. Pharmacol. Exp. Ther.*, 277 (1996) 775-783.
- 4185 Jagota, N.K., Chetram, A.J. and Nair, J.B.: Ion chromatography of amylamine and tert.-butylamine in pharmaceuticals. *J. Chromatogr. A*, 739 (1996) 343-349.
- 4186 Krizek, M. and Hlavata, V.: (Assessment of biogenic amines in beer). *Kvasny Prum.*, 41 (1995) 265-269; C.A., 124 (1996) 287319y.
- 4187 Kumagai, H., Shimizu, N., Shimomura, Y., Sakai, T. and Inoue, Y.: Retention behavior of methylamines, ethylenediamine and N-methyl-substituted ethylenediamines on a cation-exchange resin having a polycarboxylic acid as the functional group. *J. Chromatogr. A*, 739 (1996) 327-331.
- 4188 Lee, H.-B., Peart, T.E. and Kaiser, K.E.: Determination of nitrilotriacetic, ethylenediaminetetraacetic and diethylenetriaminepentaacetic acids in sewage treatment plant and paper mill effluents. *J. Chromatogr. A*, 738 (1996) 91-99.
- 4189 Pace, C.M., Donnelly, J.R., Jeter, J.L., Brumley, W.C. and Sovocool, G.W.: Determination of aromatic amines in soils. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 777-783.
- 4190 Rey, M.A. and Pohl, C.A.: Novel cation-exchange stationary phase for the separation of amines and of six common inorganic cations. *J. Chromatogr. A*, 739 (1996) 87-97.
- 4191 Steinert, J., Khalaf, H., Keese, W. and Rimpler, M.: Sensitive liquid chromatographic determination of hydrophobic primary and secondary amines by derivatization to form highly fluorescent thiazoles. *Anal. Chim. Acta*, 327 (1996) 153-159.

For additional information see C.A.:
124 (1996) 315255v.

See also 3848, 4113, 4192, 4216, 4226.

17b. Catecholamines and their metabolites

- 4192 Bustó, O., Guasch, J. and Borrull, F.: Determination of biogenic amines in wine after precolumn derivatization with 6-aminoquinolyl-N-hydroxysuccinimidyl carbamate. *J. Chromatogr. A*, 737 (1996) 205-213.
- 4193 Cao, G.-M. and Hoshino, T.: High-performance liquid chromatographic determination of catecholamines, serotonin and their metabolites with three-potential electrochemical detection. *Anal. Sci.*, 12 (1996) 183-188; C.A., 124 (1996) 311496b.
- 4194 Javidan, S. and Cwik, M.J.: Determination of catecholamines in human plasma by HPLC with electrochemical detection. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1339-1348.

- 4195 Pussard, E., Guigueno, N., Adam, O. and Giudicelli, J.-F.: Validation of HPLC-amperometric detection to measure serotonin in plasma, platelets, whole blood, and urine. *Clin. Chem. (Washington)*, 42 (1996) 1086-1091.
- 4196 Rizzo, V., Pastore, R., Pankopf, S., Melzi D'Eril, G.V. and Moratti, R.: Determination of total and non-protein-bound fractions of L-dopa in blood plasma by liquid chromatography and electrochemistry. *Biog. Amines*, 12 (1996) 1-7; C.A., 124 (1996) 277835z.
- 4197 Yeung, P.K.F., Buckley, S.J., Pedder, S.C.J. and Dingemanse, J.: Determination of 3,4-dihydroxyphenylacetic acid and 5-hydroxyindoleacetic acid in human plasma by a simple and rapid high-performance liquid chromatography assay. *J. Pharm. Sci.*, 85 (1996) 451-453.

See also 3894.

17c. Urea and guanidine derivatives

For additional information see C.A.:
125 (1996) 25286k.

See also 4090.

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

- 4198 Chen, S., Soneji, V. and Webster, J.: Determination of choline in pharmaceutical formulations by reversed-phase high-performance liquid chromatography and postcolumn suppression conductivity detection. *J. Chromatogr. A*, 739 (1996) 351-357.
- 4199 Ge, S.-J. and Lee, T.-C.: Effective HPLC method for the determination of aromatic Amadori compounds. *J. Agric. Food Chem.*, 44 (1996) 1053-1057; C.A., 124 (1996) 230305m.
- 4200 Kato, T., Liu, J.K., Yamamoto, K., Osborne, P.G. and Niwa, O.: Detection of basal acetylcholine release in the microdialysis of rat frontal cortex by high-performance liquid chromatography using a horseradish peroxidase-osmium redox polymer electrode with preenzyme reactor. *J. Chromatogr. B*, 682 (1996) 162-166.
- 4201 Spanne, M., Tinnerberg, H., Dalene, M. and Skarping, G.: Determination of complex mixtures of airborn isocyanates and amines. Part 1. Liquid chromatography with ultraviolet detection of monomeric and polymeric isocyanates as their dibutylamin derivatives. *Analyst (Cambridge)*, 121 (1996) 1095-1099.
- 4202 Spanne, M., Tinnerberg, H., Dalene, M. and Skarping, G.: Determination of complex mixtures of airborn isocyanates and amines. Part 2. Toluidisocyanate and aminoisocyanate and toluediamine after thermal degradation of a toluene diisocyanate-polyurethane. *Analyst (Cambridge)*, 121 (1996) 1101-1106.
- 4203 Tanaka, K., Ohta, K. and Fritz, J.S.: Ion-exclusion chromatography of ethanolamines on an anion-exchange resin by elution with polyols and sugars. *J. Chromatogr. A*, 739 (1996) 317-325.

See also 3925, 4855.

18. AMINO ACIDS AND PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS
- 18a. *Amino acids and their derivatives*
- 4204 Ali, A.M., Abdul, A.B., Mohd, S., Kamis, A. and Kadir, K.A.: Separation of ^{125}I -labeled triiodothyronine (T3) and thyroxine (T4) on a Sephadex G25 column with the elution of sodium hydroxide buffer. *J. Sains Nukl. Malays.*, 12 (1994) 287-293; C.A., 124 (1996) 279352p.
- 4205 Basiuk, V. and Gromovoy, T.Y.: Free energies of adsorption of amino acids, short linear peptides and 2,5-piperazinediones in silica from water as estimated from high-performance liquid-chromatographic retention data. *Adsorption*, 2 (1996) 145-152; C.A., 124 (1996) 353586m.
- 4206 Beluaars, P.R., van Dijk, R., Bisshop, E. and Spielenberg, W.M.: Liquid chromatographic determination of free glutamic acid in soup, meat products, and chinese food: interlaboratory study. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 697-702.
- 4207 Brückner, H. and Leitenberger, M.: LC-separation of derivatized DL-amino acids by aminopropylsilica-bonded Margey's reagent and analog. *Chromatographia*, 42 (1996) 683-689.
- 4208 Carunchio, V., Costanzi, H. and Girelli, A.M.: A new assay for argininosuccinate in urine samples by high-performance liquid chromatography. *Anal. Lett.*, 29 (1996) 1365-1375.
- 4209 Christner, P., Yankowski, R.L., Benditt, M. and Jimenez, S.A.: Alteration in the conformational stability of collagen caused by the incorporation of the lysine analogue S-2-aminoethylcysteine. *Biochim. Biophys. Acta*, 1294 (1996) 37-47.
- 4210 Durand, P., Fortin, L.J., Lussier-Cacan, S., Davignon, J. and Blache, D.: Hyperhomocysteinemia induced by folic acid deficiency and methionine load - applications of a modified HPLC method. *Clin. Chim. Acta*, 252 (1996) 83-93.
- 4211 Fekkes, D.: State-of-the-art of high-performance liquid chromatographic analysis of amino acids in physiological samples. *J. Chromatogr. B*, 682 (1996) 3-22 - a review with 43 refs.
- 4212 Ford, D.A., Han, X., Horner, C.C. and Gross, R.W.: Accumulation of unsaturated acylcarnitine molecular species during acute myocardial ischemia: metabolic compartmentalization of products of fatty acyl chain elongation in the acylcarnitine pool. *Biochemistry*, 35 (1996) 7903-7909.
- 4213 Jemnitz, K. and Vereczkey, L.: Ion-pair high-performance liquid chromatographic separation of two thyroxine glucuronides formed by rat liver microsomes. *J. Chromatogr. B*, 681 (1996) 385-389.
- 4214 Jensen, A.L. and Foltmann, B.: Determination of phosphoserine in human pepsinogens. *Scand. J. Clin. Lab. Invest.*, 56 (1996) 69-74; C.A., 124 (1996) 225434y.
- 4215 Kuhl, D.A., Methvin, J.T. and Dickerson, R.N.: Standardization of acid hydrolysis procedure for urinary 3-methylhistidine determination by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 390-394.
- 4216 La Croix, R., Dostert, P. and Strolin Benedetti, M.: Sensitive high-performance liquid chromatographic method for the determination of 2-phenylethylamine in human urine. *J. Chromatogr. B*, 681 (1996) 185-190.

- 4217 Offenbacher, M., Santer, G., Totschnig, K., Su, Z., Moser, H., Traber, R. and Schneider-Scherzer, E.: Biosynthesis of the unusual amino acid (4R)-4-[(E)-2-but-enyl]-4-methyl-L-threonine of cyclosporin A: enzymatic analysis of the reaction sequence including identification of the methylation precursor in a polyketide pathway. *Biochemistry*, 35 (1996) 8401-8412.
- 4218 Oishi, H., Nomiyama, H., Nomiyama, K. and Tomokuni, K.: Fluorometric HPLC determination of Δ -aminolevulinic acid (ALA) in the plasma and urine of lead workers: biological indicators of lead exposure. *J. Anal. Toxicol.*, 20 (1996) 106-110; C.A., 124 (1996) 222962h.
- 4219 Pisano, A., Packer, N.H., Redmond, J.W., Williams, K.L. and Gooley, A.A.: Identification and characterization of glycosylated phenylthiocarbonyl amino acids. In: Atassi, M.Z. and Appella, E. (Editors), *Methods Protein Struct. Anal.*, [Proc. Int. Conf.J, 10th 1994, Plenum, New York, 1995, pp. 69-80; C.A., 124 (1996) 225429a.
- 4220 Rossetti, V. and Lombard, A.: Determination of glutamate decarboxylase by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 63-67.
- 4221 Saurina, J. and Hernández-Cassou, S.: Chromatographic determination of amino acids by pre-column derivatization using 1,2-naphthoquinone-4-sulfonate as reagent. *J. Chromatogr. A*, 740 (1996) 21-30.
- 4222 Skoty, D.R., Lee, W.-Y. and Nieman, T.A.: Determination of dansyl amino acids and oxalate by HPLC with electrogenerated chemiluminescence detection using tris(2,2'-bipyridyl)ruthenium(II) in the mobile phase. *Anal. Chem.*, 68 (1996) 1530-1535.
- 4223 Woo, K.-L. and Ahan, Y.-K.: Determination of protein amino acids as benzylthiocarbamyl derivatives compared with phenylthiocarbamyl derivatives by reversed-phase high-performance liquid chromatography, ultraviolet detection and precolumn derivatization. *J. Chromatogr. A*, 740 (1996) 41-50.
- 4224 Woo, K.-L., Hwang, Q.-C. and Kim, H.-S.: Determination of amino acids in the foods by reversed-phase high-performance liquid chromatography with a new precolumn derivative, butylthiocarbamyl amino acid, compared to the conventional phenylthiocarbamyl derivatives and ion-exchange chromatography. *J. Chromatogr. A*, 740 (1996) 31-40.
- 4225 Yan, J.X., Wilkins, M.R., Ou, K., Gooley, A.A., Williams, K.L., Sanchez, J.-C., Golaz, O., Pasquali, C. and Hochstrasser, D.F.: Large-scale amino-acid analysis for proteome studies. *J. Chromatogr. A*, 736 (1996) 291-302.
- 4226 Yokoyama, Y., Ozaki, O. and Sato, H.: Separation and determination of amino acids, creatinine, bioactive amines and nucleic acid bases by dual-mode gradient ion-pair chromatography. *J. Chromatogr. A*, 739 (1996) 333-342.
- For additional information see C.A.:
124 (1996) 299060v, 306001g, 331121d.
- See also 3899, 3926, 3958, 3974, 3980, 4555, 4833.
- 18b. Peptides, peptidic and proteinous hormones, growth factors
- 4227 Abbruscato, T.J., Williams, S.A., Misicka, A., Lipkowski, A.W., Hruby, V.J. and Davis, T.P.: Blood-to-central nervous system entry and stability of biphalin, a unique double-enkephalin analog, and its halogenated derivatives. *J. Pharmacol. Exp. Ther.*, 276 (1996) 1049-1057.
- 4228 Andersson, L. and Hansen, P.: Equilibrium binding of peptides to immobilized Cu²⁺. *Int. J. Bio-Chromatogr.*, 1 (1996) 293-300; C.A., 124 (1996) 237235r.
- 4229 Bogumil, R., Faller, P., Pountney, D.L. and Vasak, M.: Evidence for Cu(I) clusters and Zn(II) clusters in neuronal growth-inhibitory factor isolated from bovine brain. *Eur. J. Biochem.*, 238 (1996) 698-705.
- 4230 Carvalho, K.M., Boileau, G., Camargo, A.C.M. and Juliano, L.: A highly selective assay for neutral endopeptidase based on the cleavage of a fluorogenic substrate related to leu-enkephalin. *Anal. Biochem.*, 237 (1996) 163-173.
- 4231 Casal, V., Martin-Alvarez, P.J. and Herranz, T.: Comparative prediction of the retention behaviour of small peptides in several reversed-phase high-performance liquid chromatography columns by using partial least squares and multiple linear regression. *Anal. Chim. Acta*, 326 (1996) 77-84.
- 4232 Chang, J.P., Ferguson, T.H., Record, P.A., Dickson, D.A., Kiehl, D.E. and Kennington, A.S.: Improved potency assay for recombinant bovine somatotropin by high-performance size-exclusion chromatography. *J. Chromatogr. A*, 736 (1996) 97-104.
- 4233 Chung, B.H., Palgunachari, M.N., Mishra, V.K., Chang, C.H., Segrest, J.P. and Amantharamaih, G.M.: Probing structure and function of VLDL by synthetic amphipathic helical peptides. *J. Lipid Res.*, 37 (1996) 1099-1112.
- 4234 Cui, H., Reubaet, J.L.E. and Bult, A.: Precolumn fluorescence derivatization of the antagonist [Arg₆D-Trp^{7,9},MePhe⁸]-substance P{6-11} with benzoin in high-performance liquid chromatography and selective detection of arginine-containing fragments in its degradation products. *J. Chromatogr. A*, 736 (1996) 91-96.
- 4235 D'Eramo, J.L., Somoza, G.M., Stefano, A., Canosa, L.F. and Friedman, O.: Rapid separation of gonadotropin-releasing hormone molecular forms by isocratic high-performance liquid chromatography on an ion-exchange column. *J. Chromatogr. B*, 682 (1996) 219-224.
- 4236 Ding, C.-r.: (Purification of human chorionic gonadotropin (HCG) with *Ricinus communis* agglutinin affinity chromatography). *Yaowu Shengwu Jishu*, 1 (1994) 33-35; C.A., 125 (1996) 1570x.
- 4237 Edwards, C., Lawton, L.A., Coyle, S.M. and Ross, P.: Automated purification of microcystins. *J. Chromatogr. A*, 734 (1996) 175-182.
- 4238 Edwards, C., Lawton, L.A., Coyle, S.M. and Ross, P.: Laboratory-scale purification of microcystins using flash chromatography and reversed-phase high-performance liquid chromatography. *J. Chromatogr. A*, 734 (1996) 163-173.
- 4239 Forkert, P.G., Lee, R.P., Dowsley, T.F., Hong, J.-Y. and Ulreich, J.B.: Protection from 1,1-dichloroethylene-induced Clara cell injury by diallyl sulfone, a derivative of garlic. *J. Pharmacol. Exp. Ther.*, 277 (1996) 1665-1671.

- 4240 Friede, T., Gnau, V., Jung, G., Keiholz, W., Stevanovic, S. and Rammensee, H.-G.: Natural ligand motifs of closely related HLA-DR4 molecules predict features of rheumatoid arthritis associated peptides. *Biochim. Biophys. Acta*, 1316 (1996) 85-101.
- 4241 Giannola, L.I., De Caro, V., Avellone, G. and Bousquet, E.: L-Pyroglutamyl-L-tryptophan derivatives as potential drug carriers. II. Permeation behaviour and stability in the gastro-intestinal tract. *Pharmazie*, 51 (1996) 487-489.
- 4242 Lamano, N.S., Zhu, X. and Lindberg, I.: Purification and enzymatic characterization of recombinant prohormone convertase 2: stabilization of activity by 21 kDa 782. *Arch. Biochem. Biophys.*, 330 (1996) 238-250.
- 4243 Loutelier, C., Cherton, J.-C., Lange, C., Traris, M. and Vey, A.: Studies on the dynamics of the production of destruxins by *Metarhizium anisopliae*. Direct high-performance liquid chromatographic and fast atom bombardment mass spectrometric analysis correlated with biological activity tests. *J. Chromatogr. A*, 738 (1996) 181-189.
- 4244 Melkko, J., Kauppila, S., Niemi, S., Risteli, L., Haukipuro, K., Jukkola, A. and Risteli, J.: Immunoassay for intact amino-terminal propeptide of human type I procollagen. *Clin. Chem. (Washington)*, 42 (1996) 947-954.
- 4245 Morita, S., Fukase, M., Yamagauchi, M. and Morita, Y.: Substrate specificity of a novel serine protease from soybean [*Glycine max* (L.) Merrill]. *J. Biochem. (Tokyo)*, 119 (1996) 1094-1099.
- 4246 Moritz, R.L., Eddes, J. and Simpson, R.J.: High-speed chromatographic separation of proteins and peptides for high sensitivity microsequence analysis. In: Atassi, M.Z. and Appella, E. (Editors), *Methods Protein Struct. Anal., [Proc. Int. Conf.]*, 10th 1994, Plenum, New York, 1995, pp. 27-38; C.A., 124 (1996) 225428z.
- 4247 Mucha, P., Rekowski, P., Kupryszewski, G. and Barciszewski, J.: Monitoring of the purification of systemin by capillary electrophoresis. *J. Chromatogr. A*, 734 (1996) 410-415.
- 4248 Nagatomo, Y., Kitamura, K., Kangawa, K., Fujimoto, Y. and Eto, T.: Proadrenomedullin N-terminal 20 peptide is rapidly cleaved by natural endopeptidase. *Biochem. Biophys. Res. Commun.*, 223 (1996) 539-543.
- 4249 Ohmacht, R. and Kiss, I.: Application of a new non-porous stationary phase (Kovasil-H) for the fast separation of peptides by HPLC. *Chromatographia*, 42 (1996) 595-598.
- 4250 Pacakova, V., Suchankova, J. and Stulik, K.: Separation of biologically active peptides by capillary electrophoresis and high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 69-76.
- 4251 Salzet, M., Bulet, P., Weber, W.-M., Clauss, W., Verger-Bocquet, M. and Malecha, J.: Structural characterization of a novel neuropeptide from the central nervous system of the leech *Erpobdella octoculata*. The leech osmoregulator factor. *J. Biol. Chem.*, 271 (1996) 7237-7243.
- 4252 Sörhede, M., Mulder, H., Mei, J., Sundler, F. and Erlanson-Albertsson, C.: Procolipase is produced in the rat stomach - a novel source of enterostatin. *Biochim. Biophys. Acta*, 1301 (1996) 207-212.
- 4253 Strömqvist, M., Karlsson, K.-E., Björquist, P., Andersson, J.-O., Byström, M., Hansson, L., Johansson, T. and Deinum, J.: Characterisation of the complex of plasminogen activator inhibitor type I with tissue-type plasminogen activator by mass spectrometry and size-exclusion chromatography. *Biochim. Biophys. Acta*, 1295 (1996) 103-109.
- 4254 Szokan, G. and Janaky, T.: (High-efficiency liquid chromatography in peptide chemistry). *Kem. Ujabb Eredmenyei*, 79 (1995) 244; C.A., 124 (1996) 305945f - a review with 861 refs.
- 4255 Urlaub, H., Kraft, V. and Wittmann-Liebold, B.: Purification scheme for isolation and identification of peptides crosslinked to the rRNA in ribosomes. In: Atassi, M.Z. and Appella, E. (Editors), *Methods Protein Struct. Anal., [Proc. Int. Conf.]*, 10th 1994, Plenum, New York, 1995, pp. 275-282; C.A., 124 (1996) 255189q.
- 4256 Wainwright, G., Webster, S.G., Wilkinson, M.C., Chung, J.S. and Rees, H.H.: Structure and significance of mandibular organ-inhibiting hormone in the crab, *Cancer pagurus*. Involvement in multihormonal regulation of growth and reproduction. *J. Biol. Chem.*, 271 (1996) 12749-12754.
- 4257 Williams, D.E., Craig, M., Holmes, C.F.B. and Andersen, R.J.: Ferintoic acids A and B, new cyclic hexapeptide from the freshwater cyanobacterium *Microcystis aeruginosa*. *J. Natural Prod.*, 59 (1996) 570-575.
- 4258 Xu, W. and Chiao, J.W.: Biochemical characteristics of a human myeloid leukemia cell differentiation factor. *Prepar. Biochem. Biotechnol.*, 26 (1996) 21-30.
- 4259 Ye, J.M., Lee, G.E., Potti, G.K., Galelli, J.F. and Wolfe, J.L.: Degradation of antiflammii 2 under acidic conditions. *J. Pharm. Sci.*, 85 (1996) 695-699.
- See also 3914, 3926, 4065, 4081, 4205, 4260, 4286, 4298, 4396, 4406, 4420, 4625, 4719, 4887.
- 18c. Elucidation of structure of proteins and enzymes
- 4260 Akyama, T. and Sasagawa, R.: (Method for separation of amino-terminus peptide of amino-terminus blocked protein). *Jpn. Kokai Tokkyo Koho JP 08 27,180 [96 27,180]* (Cl. C07K1/20), 30 Jan. 1996, Appl. 94/183,875, 13 Jul. 1994; 4 pp.; C.A., 124 (1996) 317894b.
- 4261 Baum, E.Z., Ding, W., Siegel, M.M., Hulmes, J., Bebernitz, G.A., Sridharan, L., Tabei, K., Krishnamurthy, G., Carofoglio, T., Groves, J.T., Bloom, J.D. et al.: Flavins inhibit human cytomegalovirus UL80 protease via disulfide bond formation. *Biochemistry*, 35 (1996) 5847-5855.
- 4262 Baum, E.Z., Siegel, M.M., Bebernitz, G.A., Hulmes, J.D., Sridharan, L., Sun, L., Tabei, K., Johnston, S.H., Wildey, M.J., Nygaard, J., Jones, T.R. et al.: Inhibition of human cytomegalovirus UL80 protease by specific intramolecular disulfide bond formation. *Biochemistry*, 35 (1996) 5838-5846.
- 4263 Christendat, D. and Turnbull, J.: Identification of active site residues of chorismate mutase-prephenate dehydrogenase from *Escherichia coli*. *Biochemistry*, 35 (1996) 4468-4479.
- 4264 Cymes, G.D. and Wolfenstein-Todel, C.: Identification of a tyrosine residue in ovine placental lactogen as essential for its binding to receptors. *Biochim. Biophys. Acta*, 1294 (1996) 31-36.

- 4265 Freborg, I., Pec, P., Luhova, L., Toyama, H., Matsushita, K., Hirata, S., Kitagawa, T., Ueno, T., Asano, Y., Kato, Y. and Adachi, O.: Two amine oxidases from *Aspergillus niger* AKU 3302 contain topa quinone as the cofactor: unusual cofactor link to the glutamyl residue occurs only at one of the enzymes. *Biochim. Biophys. Acta*, 1295 (1996) 59-72.
- 4266 Galat, A., Gerbod, M.-C., Bouet, F. and Rivière, S.: Proteins and their amino acid compositions: uniqueness, variability, and applications. *Arch. Biochem. Biophys.*, 330 (1996) 229-237.
- 4267 Garone, L., Edmunds, T., Hanson, E., Bernasconi, R., Huntington, J.A., Meagher, J.L., Fan, B. and Gettins, P.G.W.: Antithrombin-heparin affinity reduced by fucosylation of carbohydrate at asparagine 155. *Biochemistry*, 35 (1996) 8881-8889.
- 4268 Garza, H., Bennett, N., Jr. and Rodriguez, G.P.: Improved rapid method for the isolation, purification and identification of collagen glycosides. *J. Chromatogr. A*, 732 (1996) 385-389.
- 4269 Gerriets, J.E., Reiser, K.M. and Last, J.A.: Lung collagen cross-links in rats with experimentally induced pulmonary fibrosis. *Biochim. Biophys. Acta*, 1316 (1996) 121-131.
- 4270 Gross, J., Rajavel, M., Segura, E. and Grubmeyer, C.: Energy coupling in *Salmonella typhimurium* nicotinic acid phosphoribosyltransferase: identification of His-219 as site of phosphorylation. *Biochemistry*, 35 (1996) 3917-3924.
- 4271 Hynek, R., Kasicka, V., Kucerova, Z. and Kas, J.: Application of reversed-phase high-performance liquid chromatography and capillary zone electrophoresis to the peptide mapping of pepsin isoenzymes. *J. Chromatogr. B*, 681 (1996) 37-45.
- 4272 Kawasaki, T., Fujimura, Y., Usami, Y., Suzuki, M., Miura, S., Sakurai, Y., Makita, K., Taniuchi, Y., Hirano, K. and Titani, K.: Complete amino acid sequence and identification of the platelet glycoprotein Ib-binding site of jararaca GPIb-BP, a snake venom protein isolated from *Bothrops jararaca*. *J. Biol. Chem.*, 271 (1996) 10635-10639.
- 4273 Kizawa, K., Uchiwa, H. and Murakami, U.: Highly-expressed S100A3, a calcium-binding protein, in human hair cuticle. *Biochim. Biophys. Acta*, 1312 (1996) 94-98.
- 4274 Kobayashi, T., Leavis, P. and Collins, J.H.: Interaction of a troponin I inhibitory peptide with both domains of troponin C. *Biochim. Biophys. Acta*, 1294 (1996) 25-30.
- 4275 Liu, J., Zhao, H., Volk, K.J., Klohr, S.E., Kerns, E.H. and Lee, M.S.: Analysis of monoclonal antibody and immunoconjugate digests by capillary electrophoresis and capillary liquid chromatography. *J. Chromatogr. A*, 735 (1996) 357-366.
- 4276 Mary, J., Redeker, V., Le Caer, J.-P., Rossier, J. and Schmitter, J.-M.: Posttranslational modifications in the C-terminal tail of axonemal tubulin from sea urchin sperm. *J. Biol. Chem.*, 271 (1996) 9928-9933.
- 4277 McGuire, M., Carroll, L.J., Yankie, L., Thrall, S.H., Dunaway-Mariano, D., Herzberg, O., Jayaram, B. and Haley, B.H.: Determination of the nucleotide binding site within *Clostridium symbiosum* pyruvate phosphate dikinase by photoaffinity labeling, site-directed mutagenesis, and structural analysis. *Biochemistry*, 35 (1996) 8544-8552.
- 4278 Moe, O.A., Baker-Malcolm, J.F., Wang, W., Kang, C., Hromm, H.J. and Colman, R.F.: Involvement of arginine 143 in nucleotide substrate binding at the active site of adenylosuccinate synthetase from *Escherichia coli*. *Biochemistry*, 35 (1996) 9024-9033.
- 4279 Neumann, G.M., Condron, R., Thomas, I. and Polya, G.M.: Purification and sequencing of multiple forms of *Brassica napus* seed napin large chains that are calmodulin antagonists and substrates for plant calcium-dependent protein kinase. *Biochim. Biophys. Acta*, 1295 (1996) 34-43.
- 4280 Patel-King, R.S., Benashski, S.E., Harrison, A. and King, S.M.: Two functional thioredoxins containing redox-sensitive vicinal dithiols from the *Chlamydomonas* outer dynein arm. *J. Biol. Chem.*, 271 (1996) 6283-6291.
- 4281 Ursitti, J.A., Kotula, L., DeSilva, T., Curtis, P.J. and Speicher, D.W.: Mapping the human erythrocyte β -spectrin dimer initiation site using recombinant peptides and correlation of its phasing with the α -actinin dimer site. *J. Biol. Chem.*, 271 (1996) 6636-6644.
- 4282 Wen, D., Corina, K., Chow, E.P., Miller, S., Janmey, P.A. and Pepinsky, R.B.: The plasma and cytoplasmic forms of human gelsolin differ in disulfide structure. *Biochemistry*, 35 (1996) 9700-9709.
- 4283 Wright, J.D., Reuter, C.W.M. and Weber, M.J.: Identification of sites on epidermal growth factor receptors which are phosphorylated by pp60^{src} *in vitro*. *Biochim. Biophys. Acta*, 1312 (1996) 85-93.
- 4284 Xu, X., Rothwarf, D.M. and Scheraga, H.A.: Nonrandom distribution of the one-disulfide intermediates in the regeneration of ribonuclease A. *Biochemistry*, 35 (1996) 6406-6417.
- 4285 Zhang, Z., Walsh, A.B., Wu, L., McNamara, D.J., Dobrusin, E.M. and Miller, W.T.: Determinants of substrate recognition in the protein-tyrosine phosphatase, PTP1. *J. Biol. Chem.*, 271 (1996) 5386-5392.
- 4286 Zhao, Q., Sanier, F. and Piot, J.M.: Kinetics of appearance of four hemorphins from bovine hemoglobin peptic hydrolysates by HPLC coupled with photodiode array detection. *Biochim. Biophys. Acta*, 1295 (1996) 73-80.

See also 4298, 4319, 4331, 4357, 4490.

19. PROTEINS

19a. General techniques

- 4287 Andersson, M., Ramberg, M. and Johansson, B.-L.: Application of TLC analysis for stability studies on synthetic polymer- and polysaccharide-based chromatographic media intended for protein purification. *Am. Biotechnol. Lab.*, 14 (1996) 36-38; C.A., 124 (1996) 305943d - a review with 4 refs.
- 4288 Benedek, K.: The application of HPLC for proteins. In: Katz, E.D. (Editor), *High Perform. Liq. Chromatogr.: Princ. Methods Biotechnol.*, Wiley, Chichester, 1996, pp. 413-467; C.A., 125 (1996) 4633f - a review with 229 refs.
- 4289 Chakravarthy, M., Snyder, L., Vanyo, T., Holbrook, J. and Jakubowski, H.V.: Protein structure and chromatographic behavior: the separation and characterization of four proteins using gel filtration and ion-exchange chromatography and gel electrophoresis. *J. Chem. Educ.*, 73 (1996) 268-272; C.A., 124 (1996) 316062s.
- 4290 Cutler, P.: Size-exclusion chromatography. *Methods Mol. Biol. (Totowa)*, 59(Protein Purification Protocols) (1996) 255-267; C.A., 125 (1996) 4623 - a review with 9 refs.

- 4291 Gao, R., Jin, M. and Wang, S.: Studies on counteracting chromatographic electrophoresis and its utilization for protein purification. *Chin. J. Chem. Eng.*, 4 (1996) 11-18; C.A., 124 (1996) 311602h.
- 4292 Guo, L.-A. and Chang, J.-H.: (Research on the retention model of protein -and relation among the model parameters in the hydrophobic interaction chromatography). *Huaxue Xuebao*, 54 (1996) 291-297; C.A., 124 (1996) 283400v.
- 4293 Holthuis, J.J.M. and Driebergen, R.J.: Chromatographic techniques for the characterization of proteins. *Pharm. Biotechnol.*, 7(Physical Methods to Characterize Pharmaceutical Proteins) (1995) 243-299; C.A., 124 (1996) 336929h - a review with many refs.
- 4294 Huddleston, J., Abelaira, J.C., Wang, R. and Lyddiatt, A.: Protein partition between the different phases comprising poly(ethylene glycol)-salt aqueous two-phase systems, hydrophobic interaction chromatography and precipitation: a generic description in terms of salting-out effects. *J. Chromatogr. B*, 680 (1996) 31-41.
- 4295 Jungbauer, A.: Insights into the chromatography of proteins provided by mathematical modeling. *Curr. Opin. Biotechnol.*, 7 (1996) 210-218; C.A., 124 (1996) 311411v - a review with 50 refs.
- 4296 Kaltenbrunner, O. and Jungbauer, A.: Adsorption isotherms in protein chromatography. Combined influence of protein and salt concentration on adsorption isotherm. *J. Chromatogr. A*, 734 (1996) 183-194.
- 4297 Kim, Y.J.: Prediction of protein displacement by simplified immobilized metal ion affinity chromatographic model. *Bioseparation*, 5 (1995) 295-306; C.A., 124 (1996) 254908m.
- 4298 Kojima, S., Kuriki, Y., Sato, Y., Arisaka, F., Kumagai, I., Takahashi, S. and Miura, K.-i.: Synthesis of α -helix-forming peptides by gene engineering methods and their characterization by circular dichroism spectra measurements. *Biochim. Biophys. Acta*, 1294 (1996) 129-137.
- 4299 Lu, M., Albertsson, P.-Å., Johansson, G. and Tjerneld, F.: Ucon-benzoyl dextran aqueous two-phase systems: protein purification with phase component recycling. *J. Chromatogr. B*, 680 (1996) 65-70.
- 4300 Murata, H., Takao, T. and Shimonishi, Y.: Capillary liquid chromatography/electrospray mass spectrometry with a magnetic sector instrument for accurate mass measurement of peptide and protein mixtures. In: Burlingame, A.L. and Carr, S.A. (Editors), *Mass Spectrom. Biol. Sci.*, Humana, Totowa, 1996, pp. 267-280; C.A., 125 (1996) 4988a.
- 4301 Neville, B.: Reversed-phase chromatography of proteins. *Methods Mol. Biol. (Totowa)*, 59(Protein Purification Protocols) (1996) 277-292; C.A., 125 (1996) 4700a.
- 4302 Norton, T.T. and Fernandez, E.J.: Viscous fingering in size exclusion chromatography: Insight from numerical simulation. *Ind. Eng. Chem. Res.*, 35 (1996) 2460-2468; C.A., 125 (1996) 14183y.
- 4303 O'Farrell, P.: Hydrophobic interaction chromatography. *Methods Mol. Biol. (Totowa)*, 59(Protein Purification Protocols) (1996) 151-155; C.A., 125 (1996) 4698f.
- 4304 Rito-Palomares, M. and Lyddiatt, A.: Impact of cell disruption and polymer recycling upon aqueous two-phase processes for protein recovery. *J. Chromatogr. B*, 680 (1996) 81-89.
- 4305 Rodrigues, A.E., Chenou, C. and Rendueles de la Vega, M.: Protein separation by liquid chromatography using permeable POROS Q/M particles. *Chem. Eng. J. (Lausanne)*, 61 (1996) 191-201; C.A., 124 (1996) 283388x.
- 4306 Sheehan, D.: Fast protein liquid chromatography (FPLC) methods. *Methods Mol. Biol. (Totowa)*, 59(Protein Purification Protocols) (1996) 269-275; C.A., 125 (1996) 4624d - a review with 7 refs.
- 4307 Sivars, U., Bergfeldt, K., Piculell, L. and Tjerneld, F.: Protein partitioning in weakly charged polymer-surfactant aqueous two-phase systems. *J. Chromatogr. B*, 680 (1996) 43-53.
- 4308 Staby, A. and Mollerup, J.: Solute retention of lysozyme in hydrophobic interaction perfusion chromatography. *J. Chromatogr. A*, 734 (1996) 205-212.
- 4309 Ståhlberg, J. and Jönsson, B.: Influence of charge regulation in electrostatic interaction chromatography of proteins. *Anal. Chem.*, 68 (1996) 1536-1544.
- 4310 Turula, V.E., Jr.: Dynamic solution conformation of biopolymers by particle beam LC/FT-IR spectrometry (desolvation). Avail. *Univ. Microfilms Int.*, Order No. DA9604081, 1996, 268 pp.; C.A., 124 (1996) 225785p.
- 4311 Watts, J.D., Affolter, M., Krebs, D.L., Wange, R.L., Samelson, L.E. and Aebersold, R.: Electrospray-ionization mass spectrometric investigation of signal transduction pathways. Determination of sites of inducible protein phosphorylation in activated T cells. *ACS Symp. Ser.*, 619(Biochemical and Biotechnological Applications of Electrospray Ionization Mass Spectrometry) (1996) 381-407; C.A., 124 (1996) 225486s.
- For additional information see C.A.:
124 (1996) 254936u, 255217x, 283382r.
- See also 3846, 3897, 3914, 3967, 3968, 3969, 4246, 4342, 4693.
- 19b. *Proteins of cells, viruses and subcellular particles*
- 4312 Jones, M.D., Narhi, L.O., Chang, W. and Lu, H.S.: Refolding and oxidation of recombinant human stem cell factor produced in *Escherichia coli*. *J. Biol. Chem.*, 271 (1996) 11301-11308.
- 4313 Kameyama, A., Shearman, M.S., Sekiguchi, K. and Kameyama, M.: Cyclic AMP-dependent protein kinase but not protein kinase C regulates the cardiac Ca^{2+} channel through phosphorylation of its α_1 subunit. *J. Biochem. (Tokyo)*, 120 (1996) 170-176.
- 4314 Lee, R.P., Doughty, S.W., Ashman, K. and Walker, J.: Purification of hydrophobic integral membrane proteins from *Mycoplasma hyopneumoniae* by reversed-phase high-performance liquid chromatography. *J. Chromatogr. A*, 737 (1996) 273-279.
- 4315 Rahimi, N., Etchells, S. and Elliott, B.: Hepatocyte growth factor (HGF) is a copper-binding protein: a facile probe for purification of HGF by immobilized Cu(II)-affinity chromatography. *Protein Expression Purif.*, 7 (1996) 329-333; C.A., 124 (1996) 333285j.
- See also 4283, 4311, 4663.

- 19c. *Proteins synthesized by genetic manipulation, monoclonal antibodies*
- 4316 Browning, J.L., Miakowski, K., Griffiths, D.A., Bourdon, P.R., Hession, C., Ambrose, Ch.M. and Meier, W.: Preparation and characterization of soluble recombinant heterotrimeric complexes of human lymphotoxins α and β . *J. Biol. Chem.*, 271 (1996) 8618-8626.
- 4317 Chang, L.-S., Lin, J. and Wu, P.-F.: cDNA sequence analysis and expression of cardiotoxin V and a new cardiotoxin VII from *Naja naja atra* (Taiwan cobra). *Biochim. Biophys. Acta*, 1295 (1996) 1-4.
- 4318 Hentz, N.G., Vukasinovic, V. and Dannert, S.: Affinity chromatography of recombinant peptides/proteins based on calmodulin fusion tail. *Anal. Chem.*, 68 (1996) 1550-1555.
- 4319 Iwamatsu, A. and Yoshida-Kubomura, N.: Systematic peptide fragmentation of polyvinylidene difluoride(PVDF)-immobilized proteins prior to microsequencing. *J. Biochem. (Tokyo)*, 120 (1996) 29-34.
- 4320 Katoh, S., Terashima, M. and Kouno, M.: Purification of recombinant α -amylase by immunoaffinity chromatography with anti-peptide antibody. *Appl. Microbiol. Biotechnol.*, 43 (1995) 871-876; C.A., 124 (1996) 258526h.
- 4321 Pham, T.-N., Hayashi, K., Takano, R., Nakazawa, H., Mori, H., Ichida, M., Itoh, M., Eguchi, M., Matsubara, F. and Hara, S.: Expression of Bombyx family fungal protease inhibitor F from *Bombyx mori* by Baculovirus vector. *J. Biochem. (Tokyo)*, 119 (1996) 1080-1085.
- 4322 Tomita, T., Sawamura, F., Uetsuka, R., Chiba, T., Miura, S., Ikeda, M. and Tomita, I.: Inhibition of cholestrylester accumulation by 17 β -estradiol in macrophages through activation of neutral cholesterol esterase. *Biochim. Biophys. Acta*, 1300 (1996) 210-218.
- 4323 Winzerling, J.J., Pham, D.Q.-D., Kunz, S., Samaraweera, P., Law, J.H. and Porath, J.: Purification of recombinant insect trasferrin from large volumes of cell culture medium using high capacity Ni²⁺-dipicolylamine gel. *Protein Expression Purif.*, 7 (1996) 137-142; C.A., 124 (1996) 254920j.
- For additional information see C.A.:
124 (1996) 229253m.
- See also 4232, 4337, 4343, 4500.
- 19d. *Microbial and plant proteins*
- 4324 Adisaputro, I.A., Wu, Y.-J. and Etzel, M.R.: Strong cation and anion exchange membranes and beads for protein isolation from whey. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1437-1450.
- 4325 Corcelli, A., Lobasso, S., Colella, M., Trotta, M., Guerrieri, A. and Palmisano, F.: Role of palmitic acid on the isolation and properties of halorhodopsin. *Biochim. Biophys. Acta*, 1281 (1996) 173-181.
- 4326 Cross, S.J., Ciruela, A., Poomputsa, K., Romaniec, M.P.M. and Freedman, R.B.: Thermostable chaperonin from *Clostridium thermocellum*. *Biochem. J.*, 316 (1996) 615-622.
- 4327 Hamada, J.S.: Separation and molecular mass distribution of rice proteins by size-exclusion high-performance liquid chromatography in a dissociating buffer. *J. Chromatogr. A*, 734 (1996) 195-203.
- 4328 Huynh, Q.K., Borgmeyer, J.R., Smith, C.E., Bell, L.D. and Shah, D.M.: Isolation and characterization of a 30 kDa protein with antifungal activity from leaves of *Engelmannia pinnatifida*. *Biochem. J.*, 316 (1996) 723-727.
- 4329 Kasahara, K., Hayashi, K., Arakawa, T., Philo, J.S., Wen, J., Hara, S. and Yamaguchi, H.: Complete sequence, subunit structure, and complexes with pancreatic α -amylase of an α -amylase inhibitor from *Phaseolus vulgaris* white kidney beans. *J. Biochem. (Tokyo)*, 120 (1996) 177-183.
- 4330 Kouzuma, Y., Kawano, K., Kimura, M., Yamasaki, N., Kadouki, T. and Yamamoto, K.: Purification, characterization, and sequencing of two cysteine proteinase inhibitors, Sca and Scb, from sunflower (*Helianthus annuus*) seeds. *J. Biochem. (Tokyo)*, 119 (1996) 1106-1113.
- 4331 Neumann, G.M., Condron, R., Thomas, I. and Polya, G.M.: Purification and sequencing of multiple forms of *Brassica napus* seed napin small chains that are calmodulin antagonists and substrates for plant calcium-dependent protein kinase. *Biochim. Biophys. Acta*, 1295 (1996) 23-33.
- 4332 Pacakova, V., Pechancova, J. and Stulik, K.: Size-exclusion liquid chromatography and capillary electrophoresis of pollen allergens. *J. Chromatogr. B*, 681 (1996) 47-53.
- 4333 Rocher, A., Calero, M., Soriano, F. and Méndez, E.: Identification of major rye secalins as coeliac immunoreactive proteins. *Biochim. Biophys. Acta*, 1295 (1996) 13-22.
- 4334 Truuist, H. and Johansson, G.: Fractionation of wheat proteins by counter-current distribution using aqueous two-phase systems containing propionic acid. *J. Chromatogr. B*, 680 (1996) 71-80.
- 4335 Zeidler, W., Schirmer, N.K., Egle, C., Ribeiro, S., Kreutzer, R. and Sprinzl, M.: Limited proteolysis and amino acid replacements in the effector region of *Thermus thermophilus* elongation factor Tu. *Eur. J. Biochem.*, 239 (1996) 265-271.

See also 4279, 4280, 4314, 4388, 4409, 4424.

19e. *Proteins of blood, serum and blood cells*

- 4336 Adachi, T., Mogi, M., Harada, M. and Kojima, K.: Selective removal of human serum amyloid P component from rat blood by use of an immunoaffinity membrane in an extracorporeal circulation system. *J. Chromatogr. B*, 682 (1996) 47-54.
- 4337 Anonymous: Rapid purification of MAb 46.3, an IgM monoclonal antibody, from crude mouse ascitic fluid using perfusion chromatography technology. *Biochemica*, (1996) 6-8; C.A., 124 (1996) 229246m.
- 4338 Baker, R.M., Brady, A.-M., Davis, J.M., Combridge, B.S., Ejim, L.J., Kingsland, S.L., Lloyd, D.A. and Roberts, P.L.: Human therapeutic monoclonal anti-D antibody produced in long-term hollow-fiber culture. III. Validation of the chromatographic purification process. In: Beuvery, E.C., Griffiths, J.B. and Zeijlemaker, W.P. (Editors), *Anim. Cell Technol.: Dev. 21st Century*, [Proc. Meet.] 1994, Kluwer, Dordrecht, 1995, pp. 529-533; C.A., 125 (1996) 8657q.

- 4339 Bansal, V. and Sahib, H.K.: Chromatographic isolation of human α -fetoprotein (AFP). *Indian JN* 173,626 (Cl. A61K38/00), 18 Jun. 1994, Appl. 88/DE1,102, 15 Dec. 1988; 15 p.; C.A., 125 (1996) 18988n.
- 4340 Berna, N., Berna, P. and Oscarsson, S.: Cosolvent-induced adsorption and desorption of serum proteins on an amphiphilic mercaptomethylene pyridine-derivatized agarose gel. *Arch. Biochem. Biophys.*, 330 (1996) 188-192.
- 4341 Birkenmeier, G. and Kunath, M.: Ligand interaction of human α_2 -macroglobulin- α_2 -macroblobulin receptor studied by partitioning in aqueous two-phase systems. *J. Chromatogr. B*, 680 (1996) 97-103.
- 4342 Compagnini, A., Fisichella, S., Foti, S., Maccarrone, G. and Saletti, R.: Isolation by gel-permeation chromatography of a non-covalent complex of Cibacron Blue F3G-A with human serum albumin. *J. Chromatogr. A*, 736 (1996) 115-123.
- 4343 Danielsson, A., Daniels, I. and Hoepker, H.R.: (Biochromatic purification process). *LaborPraxis*, 20 (1996) 78-82; C.A., 124 (1996) 340954e.
- 4344 Ferguson, R.A., Yu, H., Kalyvas, M., Zammit, S. and Diamandis, E.P.: Ultrasensitive detection of prostate-specific antigen by a time-resolved immunofluorometric assay and the Immulite immunochemical luminescent third-generation assay: potential applications in prostate and breast cancers. *Clin. Chem. (Washington)*, 42 (1996) 675-684.
- 4345 Johnson, R.M., Buck, S., Chiu, C., Schneider, H., Sampaio, I., Gage, D.A., Shen, T., Schneider, M.P.C., Muniz, J.A., Gumucio, D.L. and Goodman, M.: Fetal globin expression in new world monkeys. *J. Biol. Chem.*, 271 (1996) 14684-14691.
- 4346 Kaetsu, H., Hashiguchi, T., Foster, D. and Ichinose, A.: Expression and release of the α and β subunits for human coagulation factor XIII in baby hamster kidney (BHK) cells. *J. Biochem. (Tokyo)*, 119 (1996) 961-969.
- 4347 McDermott, A.M. and Haslam, R.J.: Chemical cross-linking of pleckstrin in human platelets: evidence for oligomerization of the protein and its dissociation by protein kinase C. *Biochem. J.*, 317 (1996) 119-124.
- 4348 Melegos, D.N., Yu, H. and Diamandis, E.P.: Prostaglandin D₂ synthase: a component of human amniotic fluid and its association with fetal abnormalities. *Clin. Chem. (Washington)*, 42 (1996) 1042-1050.
- 4349 Serres, A., Legendre, E., Jozefonvicz, J. and Muller, D.: Affinity of mouse immunoglobulin G subclasses for sialic acid derivatives immobilized on dextran-coated supports. *J. Chromatogr. B*, 681 (1996) 219-226.
- 4350 Tanaka, K., Sawatani, E., Nakao, H.C., Dias, G.A. and Arashiro, F.: An alternative column chromatographic process for the production of human albumin. *Braz. J. Med. Biol. Res.*, 29 (1996) 185-191; C.A., 124 (1996) 254898n.
- 4351 Ubrich, N. and Rivat, C.: Antibodies released from immunoabsorbents: effect of support, activation and elution conditions. *Artif. Cells, Blood Substitutes, Immobilization Biotechnol.*, 24 (1996) 65-75; C.A., 125 (1996) 7766n.
- 4352 Wajcman, H., Ducrocq, R., Riou, J., Mathis, M., Godart, C., Prehu, C. and Galacteros, F.: Perfusion chromatography on a reversed-phase column allows fast analysis of human globin chains. *Anal. Biochem.*, 237 (1996) 80-87.
- 4353 Yamada, T., Miida, T., Itoh, Y., Kawai, T. and Benson, M.D.: Characterization of serum amyloid A4 as a plasma apolipoprotein. *Clin. Chim. Acta*, 251 (1996) 105-112.
- For additional information see C.A.:
124 (1996) 298899p.
- See also 3931, 4034, 4267, 4275, 4281, 4282, 4321, 4356, 4358, 4359, 4361, 4734.
- 19f. Structural and muscle proteins**
- 4354 Mechling, D.E., Gambee, J.E., Morris, N.P., Sakai, L.Y., Keene, D.R., Mayne, R. and Bächinger, H.P.: Type IX collagen NC1 domain peptides can trimerize *in vitro* without forming a triple helix. *J. Biol. Chem.*, 271 (1996) 13781-13785.
- 4355 Takada, Y., Aue, S. and Kumegawa, M.: When protein stimulates the proliferation and differentiation of osteoblastic MC3T3-E1 cells. *Biochem. Biophys. Res. Commun.*, 223 (1996) 445-449.
- See also 4209, 4269, 4273, 4274, 4376.
- 19h. Chromoproteins and metalloproteins**
- 4356 Eastman, J.W., Wong, R., Liao, C.L. and Morales, D.R.: Automated HPLC screening of newborns for sickle cell anemia and other hemoglobinopathies. *Clin. Chem. (Washington)*, 42 (1996) 704-710.
- 4357 Noort, D., Verheij, E.R., Hulst, A.G., de Jong, L.P.A. and Benschop, H.P.: Characterization of sulfur mustard induced structural modifications in human hemoglobin by liquid chromatography-tandem mass spectrometry. *Chem. Res. Toxicol.*, 9 (1996) 781-787; C.A., 124 (1996) 310017j.
- 4358 Ou, C.-N. and Rognerud, C.L.: Liquid chromatography in diagnosis of rare hemoglobin variant (Hb Chicago) and its combination with Hb S: Hb Chicago/S trait and Hb Chicago/sickle cell disease. *Clin. Chem. (Washington)*, 42 (1996) 774-776.
- 4359 Suh, D.D., Krauss, J.S. and Bures, K.: Influence of hemoglobin S adducts on hemoglobin A₂ quantification by HPLC. *Clin. Chem. (Washington)*, 42 (1996) 1113-1114.
- 4360 Wajcman, H., Galacteros, F. and Ducrocq, R.: Perfusion chromatography allows an order of magnitude faster measurement of the ζ/γ ratio in patients with an increased level of fetal hemoglobin. *Blood*, 87 (1996) 1655; C.A., 124 (1996) 225404p.
- 4361 Weets, I., Goris, F.K. and Gerlo, E.: Evaluation of an immuno-turbidimetric assay for haemoglobin A_{1c} on a Cobas® Mira S analyser. *Eur. J. Clin. Chem. Clin. Biochem.*, 34 (1996) 449-453.
- 4362 Yao, M.: (Separation of human hemoglobin and its adducts with trinitrotoluene by high performance liquid chromatography). *Sepu*, 14 (1996) 124-126; C.A., 124 (1996) 281268j.
- For additional information see C.A.:
124 (1996) 311767r.
- See also 4286, 4323, 4341, 4345, 4352.

- 19i. *Proteins of glands, gland products, various zymogens (incl. milk proteins)*
- 4363 Aymard, P., Gimel, J.C., Nicolai, T. and Durand, D.: Experimental evidence for a two-step process in the aggregation of β -lactoglobulin at pH 7. *J. Chim. Phys. Phys.-Chim. Biol.*, 93 (1996) 987-997; C.A., 125 (1996) 3906k.
- 4364 Cartier, G.E., Yoshikami, D., Gray, W.R., Luo, S., Olivera, B.M. and McIntosh, J.M.: A new α -conotoxin which targets $\alpha\beta 2$ nicotinic acetylcholine receptors. *J. Biol. Chem.*, 271 (1996) 7522-7528.
- 4365 García-López, N., Ollero, M., Cebrán-Pérez, J.A. and Muñoz-Blanco, T.: Reversion of thermic-shock effect on ram spermatozoa by adsorption of seminal plasma proteins revealed by partition in aqueous two-phase systems. *J. Chromatogr. B*, 680 (1996) 137-143.
- 4366 Malm, J., Hellman, J., Magnusson, H., Laurel, C.-B. and Liljan, H.: Isolation and characterization of the major gel proteins in human semen, semenogelin I and semenogelin II. *Eur. J. Biochem.*, 238 (1996) 48-53.
- 4367 Wolkershoffer, M., Laslop, A., Lasure, C., Fischer-Colbrie, R. and Winkler, H.: Processing of chromogranins in chromaffin cell culture: effects of reserpine and α -methyl-p-tyrosine. *Biochem. J.*, 316 (1996) 953-958.

For additional information see C.A.:

124 (1996) 287502c.

See also 4066, 4081, 4264, 4266, 4272, 4276, 4500.

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

- 4368 Benítez-King, G., Ríos, A., Martínez, A. and Antón-Tay, F.: *In vitro* inhibition of Ca^{2+} /calmodulin-dependent kinase II activity by melatonin. *Biochim. Biophys. Acta*, 1290 (1996) 191-196.
- 4369 Bubis, J.: Improved purification of transducin subunits from bovine retinal rod outer segments. *Biol. Res.*, 28 (1995) 291-299; C.A., 124 (1996) 225401k.
- 4370 Pahlsson, P. and Spitalnik, S.L.: The role of glycosylation in synthesis and secretion of β -amyloid precursor protein by Chinese hamster ovary cells. *Arch. Biochem. Biophys.*, 331 (1996) 177-186.
- 4371 Virsoly-Vergine, A., Salazar, G., Sillard, R., Denoroy, L., Mutt, V. and Bataille, D.: Endosulfine, endogenous ligand for the sulfonyl-urea receptor: isolation from porcine brain and partial structural determination of the α form. *Diabetologia*, 39 (1996) 135-141; C.A., 124 (1996) 283592j.
- 4372 Walker, S.G., Dale, C.J. and Lyddiatt, A.: Aqueous two-phase partition of complex protein feedstocks derived from brain tissue homogenates. *J. Chromatogr. B*, 680 (1996) 91-96.

See also 4374.

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

- 4373 Zhou, J., Mulshine, J.L., Insworth, E.J., Scott, F.M., Avis, I.M., Vos, M.D. and Treston, A.M.: Purification and characterization of a protein that permits early detection of lung cancer. Identification of heterogenous nuclear ribonucleoprotein-A2/B1 as the antigen for monoclonal antibody 703D4. *J. Biol. Chem.*, 271 (1996) 10760-10766.

19l. *Specific binding and receptor proteins*

- 4374 Alvarez-Martinez, M.-T., Mani, J.-C., Porte, F., Faivre-Sarrailh, C., Liutard, J.P. and Sri Widada, J.: Characterization of the interaction between annexin I and profilin. *Eur. J. Biochem.*, 238 (1996) 777-784.
- 4375 Betts, S.D., Ross, J.R., Hall, K.U., Pichersky, E. and Yocom, C.F.: Functional reconstitution of photosystem II with recombinant manganese-stabilizing proteins containing mutations that remove the disulfide bridge. *Biochim. Biophys. Acta*, 1274 (1996) 135-142.
- 4376 Chaga, G.S., Ersson, B. and Porath, J.O.: Isolation of calcium-binding proteins on selective adsorbents. Application to purification of bovine calmodulin. *J. Chromatogr. A*, 732 (1996) 261-269.
- 4377 Choi-Miura, N.-H., Tobe, T., Sumiya, J.-i., Nakano, Y., Sano, Y., Mazda, T. and Tomita, M.: Purification and characterization of a novel hyaluronan-binding protein (PHBP) from human plasma: it has three EGF, a kringle and a serine protease domain, similar to hepatocyte growth factor activator. *J. Biochem. (Tokyo)*, 119 (1996) 1157-1165.
- 4378 Duncalf, L.L., Carpenter, M.R., Smillie, L.B., Martin, I.L. and Dunn, S.M.J.: The major site of photoaffinity labeling of the γ -aminobutyric acid type A receptor by [3 H]flunitrazepam is histidine 102 of the α subunit. *J. Biol. Chem.*, 271 (1996) 9209-9214.
- 4379 Gee, N.S., Brown, J.P., Dissanayake, V.U.K., Offord, J., Thurlow, R. and Woodruff, G.N.: The novel anticonvulsant drug, gabapentin (neurontin), binds to the $\alpha 2\delta$ subunit of a calcium channel. *J. Biol. Chem.*, 271 (1996) 5768-5776.
- 4380 Haneskog, L., Andersson, L., Brekk, E., Englund, A.-K., Kameyama, K., Liljas, L., Greijer, E., Fischbarg, J. and Lundahl, P.: Monomeric human red cell glucose transporter (Glut1) in non-ionic detergent solution and a semi-elliptical torus model for detergent binding to membrane proteins. *Biochim. Biophys. Acta*, 1282 (1996) 39-47.
- 4381 Islam, M.O., Yoshida, Y., Koga, T., Kojima, M., Kangawa, K. and Imai, S.: Isolation and characterization of vascular smooth muscle inositol 1,4,5-trisphosphate receptor. *Biochem. J.*, 316 (1996) 295-302.
- 4382 Jouni, Z.E. and Wells, M.A.: Purification and partial characterization of a lutein-binding protein from the midgut of the silkworm *Bombyx mori*. *J. Biol. Chem.*, 271 (1996) 14722-14726.
- 4383 Kaneda, N., Talukder, A.H., Nishiyama, H., Koizumi, S. and Muramatsu, T.: Midkine, a heparin-binding growth/differentiation factor, exhibits nerve cell adhesion and guidance activity for neurite outgrowth *in vitro*. *J. Biochem. (Tokyo)*, 119 (1996) 1150-1156.
- 4384 Kise, H., Nishioka, J., Kawamura, J. and Suzuki, K.: Characterization of semenogelin II and its molecular interaction with prostate-specific antigen and protein C inhibitor. *Eur. J. Biochem.*, 238 (1996) 88-96.
- 4385 Leach, R.N., Brickley, K. and Norman, R.I.: Cyclic AMP-dependent protein kinase phosphorylates residues in the C-terminal domain of the cardiac L-type calcium channel α_1 subunit. *Biochim. Biophys. Acta*, 1281 (1996) 205-212.

4386 Middleton, S.A., Johnson, D.L., Jin, R., McMahon, F.J., Collins, A., Tullai, J., Gruninger, R.H., Jolliffe, L.K. and Mulcahy, L.S.: Identification of a critical ligand binding determinant of the human erythropoietin receptor. Evidence for common ligand binding motifs in the cytokine receptor family. *J. Biol. Chem.*, 271 (1996) 14045-14054.

4387 Tanveer, A., Virji, S., Andreeva, L., Totty, N.F., Hsuan, J.J., Ward, J.M. and Crompton, M.: Involvement of cyclophilin D in the activation of a mitochondrial pore by Ca^{2+} and oxidant stress. *Eur. J. Biochem.*, 238 (1996) 166-172.

4388 Wang, C.-C., Schultz, D.E. and Nicholas, R.A.: Localization of a putative second membrane association site in penicillin-binding protein 1B of *Escherichia coli*. *Biochem. J.*, 316 (1996) 149-156.

For additional information see C.A.:
124 (1996) 255278t.

See also 4069, 4318, 4395.

19m. Urinary proteins

4389 Bayard, C., Holmquist, L. and Vesterberg, O.: Purification and identification of allergenic $\alpha_2\text{u}$ -globulin species of rat urine. *Biochim. Biophys. Acta*, 1290 (1996) 129-134.

4390 Robertson, D.H.L., Cox, K.A., Gaskell, S.J., Evershed, R.P. and Beynon, R.J.: Molecular heterogeneity in the major-urinary proteins of the house mouse *Mus musculus*. *Biochem. J.*, 316 (1996) 265-272.

4391 Yamamoto, T., Yamamoto, K. and Sinohara, H.: Inter- α -trypsin inhibitor and its related proteins in Syrian hamster. *J. Biochem. (Tokyo)*, 120 (1996) 145-152.

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

4392 Bender, R.C. and Bayne, C.J.: Purification and characterization of a tetrameric α -macroglobulin proteinase inhibitor from the gastropod mollusc *Biomphalaria glabrata*. *Biochem. J.*, 316 (1996) 893-900.

4393 Cline, E.I., Wolowyk, M.W., Wiebe, L.I. and Samuel, J.: Separation and characterization of cardiac stimulatory protein variants from the sea anemone *Urticina piscivora* from the west coast of Canada. *Int. J. Bio-Chromatogr.*, 1 (1996) 249-260; C.A., 124 (1996) 336975v.

4394 Han, J., Chung, J., Kang, H., Donaldson, J., Bae, Y.S. and Rhee, S.G.: Multiple forms of phospholipase D inhibitor from rat brain cytosol. Purification and characterization of heat-labile form. *J. Biol. Chem.*, 271 (1996) 11163-11169.

4395 Meri, S., Lehto, T., Sutton, C.W., Tyynelä, J. and Baumann, M.: Structural composition and functional characterization of soluble CD59: heterogeneity of the oligosaccharide and glycoprophosphoinositol (GPI) anchor revealed by laser-desorption mass spectrometric analysis. *Biochem. J.*, 316 (1996) 923-935.

4396 Pellegrini, A., Thomas, U., Bramaz, N., Klauser, S., Huziker, P. and von Felleberg, R.: Identification and isolation of the bactericidal domains in the proteinase inhibitor aprotinin. *Biochem. Biophys. Res. Commun.*, 222 (1996) 559-565.

4397 Sugimoto, Y., Kusakabe, T., Nagaoka, S., Nirasawa, T., Tatsuguchi, K., Fujii, M., Aoki, T. and Koga, K.: A proteinase inhibitor from egg yolk of hen is an ovoinhibitor analog. *Biochim. Biophys. Acta*, 1295 (1996) 96-102.

See also 4315, 4384, 4446.

20. ENZYMES AND ENZYME ACTIVITY ESTIMATION

4398 Grimonprez, B. and Johansson, G.: Liquid-liquid partitioning of some enzymes, especially phosphofructokinase, from *Saccharomyces cerevisiae* at subzero temperature. *J. Chromatogr. B*, 680 (1996) 55-63.

4399 Johansson, G.: Aqueous two-phase systems with a liquid protein (bovine serum albumin) phase for partitioning of enzymes. *J. Chromatogr. B*, 680 (1996) 123-130.

4400 Venâncio, A., Almeida, C. and Teixeira, J.A.: Enzyme purification with aqueous two-phase systems: comparison between systems composed of pure polymers and systems composed of crude polymers. *J. Chromatogr. B*, 680 (1996) 131-136.

4401 Wingren, C. and Hansson, U.-B.: Enzyme conformational alterations detected by partition column chromatography. *J. Chromatogr. B*, 680 (1996) 113-122.

20a. Oxidoreductases

4402 Adachi, T., Morihara, N., Yamazaki, N., Yamada, H., Futenma, A., Kato, K. and Hirano, K.: An arginine-213 to glycine mutation in human extracellular-superoxide dismutase reduces susceptibility to trypsin-like proteinases. *J. Biochem. (Tokyo)*, 120 (1996) 184-188.

4403 Belmouden, A. and Lederer, F.: The role of a β barrel loop 4 extension in modulating the physical and functional properties of long-chain 2-hydroxy-acid oxidase isozymes. *Eur. J. Biochem.*, 238 (1996) 790-798.

4404 Burdette, D.S., Vielle, C. and Zeikus, J.G.: Cloning and expression of the gene encoding the *Thermoanaerobacter ethanolicus* 39E secondary-alcohol dehydrogenase and biochemical characterization of the enzyme. *Biochem. J.*, 316 (1996) 115-122.

4405 Chulada, P.C., Loftin, C.D., Winn, V.D., Young, D.A., Tiano, H.F., Eling, T.E. and Langenbach, R.: Relative activities of retrovirally expressed murine prostaglandin synthase-1 and -2 depend on source of arachidonic acid. *Arch. Biochem. Biophys.*, 330 (1996) 301-313.

4406 Cvrk, T., Hodek, P. and Strobel, H.W.: Identification and characterization of cytochrome P4501A1 amino acid residues interacting with a radiolabeled photoaffinity diazidobenzphetamine analogue. *Arch. Biochem. Biophys.*, 330 (1996) 142-152.

4407 Dallet, S. and Legoy, M.-D.: Hydrostatic pressure induces conformational and catalytic changes on two alcohol dehydrogenases but no oligomeric dissociation. *Biochim. Biophys. Acta*, 1294 (1996) 15-24.

4408 Dong, M.-S., Yamazaki, H., Guo, Z. and Guengerich, F.P.: Recombinant human cytochrome P450 1A2 and an N-terminal-truncated form: construction, purification, aggregation properties, and interactions with flavodoxin, ferredoxin, and NADPH-cytochrome P450 reductase. *Arch. Biochem. Biophys.*, 327 (1996) 11-19.

- 4409 Gangeswaran, R. and Eady, R.R.: Flavodoxin 1 of *Azotobacter vinelandii*: characterization and role in electron donation to purified assimilatory nitrate reductase. *Biochem. J.*, 317 (1996) 103-108.
- 4410 Gilmour, R. and Krulwich, T.A.: Purification and characterization of the succinate dehydrogenase complex and CO-reactive b-type cytochromes from the facultative alkaliphile *Bacillus firmus* OF4. *Biochim. Biophys. Acta*, 1276 (1996) 57-63.
- 4411 Gremer, L. and Meyer, O.: Characterization of xanthine dehydrogenase from the anaerobic bacterium *Veillonella atypica* and identification of a molybdopterin-cytosine-dinucleotide-containing molybdenum cofactor. *Eur. J. Biochem.*, 238 (1996) 862-866.
- 4412 Grimshaw, C.E. and Lai, C.-J.: Oxidized aldose reductase: *in vivo* factor, not *in vitro* artifact. *Arch. Biochem. Biophys.*, 327 (1996) 89-97.
- 4413 Hanlon, S.P., Toh, T.-H., Solomon, P.S., Holt, R.A. and McEwan, A.G.: Dimethylsulfide: acceptor oxidoreductase from *Rhodobacter sulfidophilus*. The purified enzyme contains b-type haem and a pterin molybdenum factor. *Eur. J. Biochem.*, 239 (1996) 391-396.
- 4414 Iizuka, R., Ishida, J., Yoshitake, T., Nakamura, M. and Yamaguchi, M.: Assay for tryptophan hydroxylase activity in rat brain by high-performance liquid chromatography with fluorescence detection. *Biol. Pharm. Bull.*, 19 (1996) 762-764; C.A., 125 (1996) 4060s.
- 4415 Imai, H., Sumi, D., Sakamoto, H., Hanamoto, A., Arai, M., Chiba, N. and Nakagawa, Y.: Overexpression of phospholipid hydroperoxide glutathione peroxidase suppressed cell death due to oxidative damage in rat basophile leukemia cells. *Biochem. Biophys. Res. Commun.*, 222 (1996) 432-438.
- 4416 Kikonyogo, A. and Pietruszko, R.: Aldehyde dehydrogenase from adult human brain that hydrogenates γ -aminobutyraldehyde. Purification, characterization, cloning and distribution. *Biochem. J.*, 316 (1996) 317-324.
- 4417 Klein, A.R., Berk, H., Purwantini, E., Daniels, L. and Thauer, R.K.: Si-face stereospecificity at C5 of coenzyme F₄₂₀ for F₄₂₀-dependent glucose-6-phosphate dehydrogenase from *Mycobacterium smegmatis* and F₄₂₀-dependent alcohol dehydrogenase from *Methanococcus thermophilicus*. *Eur. J. Biochem.*, 239 (1996) 93-97.
- 4418 Lagendijk, J., Ubbink, J.B. and Vermaak, W.J.H.: Measurement of the ratio between the reduced and oxidized forms of coenzyme Q₁₀ in human plasma as a possible marker of oxidative stress. *J. Lipid Res.*, 37 (1996) 67-75.
- 4419 Leclercq, I., Desager, J.P., Vandenplas, C. and Horsmans, Y.: Fast determination of low-level cytochrome P-450 1A1 activity by high-performance liquid chromatography with fluorescence or visible absorbance detection. *J. Chromatogr. B*, 681 (1996) 227-232.
- 4420 Maiorino, M., Roche, C., Kiess, M., Koenig, K., Gawlik, D., Matthes, M., Naldini, E., Pierce, R. and Flohé, L.: A selenium-containing phospholipid-hydroperoxide glutathione peroxidase in *Schistosoma mansoni*. *Eur. J. Biochem.*, 238 (1996) 838-844.
- 4421 Matsuda, M., Ishikawa, T., Takeda, T. and Shigeoka, S.: The catalase-peroxidase of *Synechococcus* PCC 7942: purification, nucleotide sequence analysis and expression in *Escherichia coli*. *Biochem. J.*, 316 (1996) 251-257.
- 4422 Meng, H. and Campbell, W.H.: Characterization and site-directed mutagenesis of aspen lignin-specific O-methyltransferase expressed in *Escherichia coli*. *Arch. Biochem. Biophys.*, 330 (1996) 329-341.
- 4423 Norman, H.A. and Pillai, P.: High-performance liquid chromatographic resolution of NADP⁺ after induction of fluorescence and its application to assay for an NADPH-dependent enzyme: application to the determination of glutathione reductase activity in plant leaf extract. *Anal. Biochem.*, 237 (1996) 30-36.
- 4424 Núñez-Delgado, E., Bru, R., Sánchez-Ferrer, A. and García-Carmona, F.: Triton X-114-aided purification of latent tyrosinase. *J. Chromatogr. B*, 680 (1996) 105-112.
- 4425 Oury, T.D., Crapo, J.D., Valnickova, Z. and Enghild, J.J.: Human extracellular superoxide dismutase is a tetramer composed of two disulphide-linked dimers: a simplified, high-yield purification of extracellular superoxide dismutase. *Biochem. J.*, 317 (1996) 51-57.
- 4426 Padiglia, A., Medda, R., Cruciani, E., Lorrai, A. and Floris, G.: Purification and properties of *Oryza sativa* Cu-Zn superoxide dismutase. *Prepar. Biochem. Biotechnol.*, 26 (1996) 135-142.
- 4427 Provost, J.J., Ray, P.D. and Lambeth, D.O.: Concomitant purification and characterization of malate dehydrogenase, aspartame transaminase, nucleoside diphosphate kinase and enolase from rabbit liver cytosol. *Prepar. Biochem. Biotechnol.*, 26 (1996) 121-133.
- 4428 Ratnam, K., Brody, M.S. and Hille, R.: Purification of xanthine dehydrogenase and sulfite oxidase from chicken liver. *Prepar. Biochem. Biotechnol.*, 26 (1996) 143-154.
- 4429 Razquin, P., Fillat, M.F., Schmitz, S., Stricker, O., Böhme, H., Gomez-Moreno, C. and Peleato, M.L.: Expression of ferredoxin-NADP⁺ reductase in heterocytes from *Anabaena* sp. *Biochem. J.*, 316 (1996) 157-160.
- 4430 Seibold, B., Matthes, M., Epping, M.H.M., Lingens, F., van Berkel, W.J.H. and Müller, R.: 4-Hydroxybenzoate hydroxylase from *Pseudomonas* sp. CBS3. Purification, characterization, gene cloning, sequence analysis and assignment of structural features determining the coenzyme specificity. *Eur. J. Biochem.*, 239 (1996) 469-478.
- 4431 Sengupta, S., Shaila, M.S. and Rao, G.R.: Purification and characterization of assimilatory nitrite reductase from *Candida utilis*. *Biochem. J.*, 317 (1996) 147-155.
- 4432 Shalloe, F., Elliott, G., Ennis, O. and Mantle, T.J.: Evidence that biliverdin-IX β reductase and flavin reductase are identical. *Biochem. J.*, 316 (1996) 385-387.
- 4433 Svensson, T., Kilpeläinen, S.H., Hiltonen, J.K. and Alexson, S.E.H.: Characterization and isolation of enzymes that hydrolyze short-chain acyl-CoA in rat-liver mitochondria. *Eur. J. Biochem.*, 239 (1996) 526-531.
- 4434 Tamoi, M., Ishikawa, T., Takeda, T. and Shigeoka, S.: Enzymic and molecular characterization of NADP-dependent glyceraldehyde-3-phosphate dehydrogenase from *Synechococcus* PCC 7942: resistance of the enzyme to hydrogen peroxide. *Biochem. J.*, 316 (1996) 685-690.
- 4435 Uemura, K., Suzuki, Y., Shikanai, T., Wadano, A., Jensen, R.G., Chmara, W. and Yokota, A.: A rapid and sensitive method for determination of relative specificity of RuBisCO from various species by anion-exchange chromatography. *Plant Cell Physiol.*, 37 (1996) 325-331; C.A., 124 (1996) 310840x.

- 4436 Willie, A., Edmondson, D.E. and Jorns, M.S.: Sarcosine oxidase contains a novel covalently bound FMN. *Biochemistry*, 35 (1996) 5292-5299.
- 4437 Yamamoto, T., Moriwaki, Y., Takahashi, S., Tsutsumi, Z., Yamakita, J.-i., Nasako, Y., Hiroishi, K. and Higashino, K.: Determination of human plasma xanthine oxidase activity by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 395-400.
- See also 3994, 4263, 4265.
- 20b. *Transferases (excl. E.C. 2.7.-.)*
- 4438 Aigner, A., Jäger, M., Pasternack, R., Weber, P., Wienke, D. and Wolf, S.: Purification and characterization of cysteine-S-conjugate N-acetyltransferase from pig kidney. *Biochem. J.*, 317 (1996) 213-218.
- 4439 Battchikova, N., Hirninen, J.-P., Ahjolahti, M. and Korpela, T.: Phosphoserine aminotransferase from *Bacillus circulans* subsp. *alkalophilus*: purification, gene cloning and sequencing. *Biochim. Biophys. Acta*, 1295 (1996) 187-194.
- 4440 Boeck, B. and Schinzel, R.: Purification and characterization of an α -glucan phosphorylase from the thermophilic bacterium *Thermus thermophilus*. *Eur. J. Biochem.*, 239 (1996) 150-155.
- 4441 Capasso, J.M., Capasso, A. and Kaplan, A.: Subcellular distribution of 'intersecting' β -N-acetylglucosaminyltransferase in *Dictyostelium discoideum*. A likely marker for the Golgi apparatus. *Biochim. Biophys. Acta*, 1281 (1996) 15-22.
- 4442 Ishikawa, K., Kaneko, E. and Ichiyama, A.: Pyridoxal 5'-phosphate binding of a recombinant rat serine:pyruvate/alanine:glyoxylate aminotransferase. *J. Biochem. (Tokyo)*, 119 (1996) 970-978.
- 4443 Jemth, P., Stenberg, G., Chaga, G. and Mannervik, B.: Heterologous expression, purification and characterization of rat class Theta glutathione transferase. *Biochem. J.*, 316 (1996) 131-136.
- 4444 Kenyon, S.H., Nicolaou, A., Ast, T. and Gibbons, W.A.: Stimulation *in vitro* of vitamin B₁₂-dependent methionine synthase by polyamines. *Biochem. J.*, 316 (1996) 661-665.
- 4445 Kobayashi, M., Habuchi, H., Habuchi, O., Saito, M. and Kimata, K.: Purification and characterization of heparan sulfate 2-sulfotransferase from cultured Chinese hamster ovary cells. *J. Biol. Chem.*, 271 (1996) 7645-7653.
- 4446 Mazhari-Tabrizi, R., Eckert, V., Blank, M., Müller, R., Mumber, D., Funk, M. and Schwarz, R.T.: Cloning and functional expression of glycosyltransferases from parasitic protozoans by heterologous complementation in yeast: the dolichol phosphate mannose synthase from *Trypanosoma brucei brucei*. *Biochem. J.*, 316 (1996) 853-858.
- 4447 Ng, K., Handman, E. and Bacic, A.: Biosynthesis of lipophosphoglycan from *Leishmania major*: solubilization and characterization of a (β 1-3)-galactosyltransferase. *Biochem. J.*, 317 (1996) 247-255.
- 4448 Szumilo, T., Zeng, Y., Pastuszak, I., Drake, R., Szumilo, H. and Elbein, A.D.: Purification to homogeneity and properties of UDP-GlcNAc (GalNAc) pyrophosphorylase. *J. Biol. Chem.*, 271 (1996) 13147-13154.

- 4449 West, Ch.M., Scott-Ward, T., Teung-umnuay, P., van der Wel, H., Kozarev, E. and Huynh, A.: Purification and characterization of an α 1,2-L-fucosyltransferase, which modifies the cytosolic protein FP21, from the cytosol of *Dictyostelium*. *J. Biol. Chem.*, 271 (1996) 12024-12035.
- 4450 Yamamoto, T., Nakashizuka, M., Kodama, H., Kajihara, Y. and Terada, I.: Purification and characterization of a marine bacterial β -galactoside α 2,6-sialyltransferase from *Photobacterium damsela* JT0160. *J. Biochem. (Tokyo)*, 120 (1996) 104-110.
- See also 4270, 4427.
- 20c. *Transferases transferring phosphorus containing groups (E.C. 2.7.-.)*
- 4451 Bruchhaus, I., Jacobs, T., Denart, M. and Tannich, E.: Pyrophosphate-dependent phosphofructokinase of *Entamoeba histolytica*: molecular cloning, recombinant expression and inhibition by pyrophosphate analogues. *Biochem. J.*, 316 (1996) 57-63.
- 4452 Cornell, K.A., Winter, R.W., Tower, P.A. and Riscoe, M.K.: Affinity purification of 5-methylthioadenosine kinase and 5-methylthioribose/S-adenosylhomocysteine nucleosidase from *Klebsiella pneumoniae*. *Biochem. J.*, 317 (1996) 285-290.
- 4453 Fernández, A., Ribeiro, J.M., Costas, M.J., Pinto, R.M., Canales, J. and Cameselle, J.C.: Specific ADP-ribose pyrophosphatase from *Artemia* cysts and rat liver: effects of nitroprusside, fluoride and ionic strength. *Biochim. Biophys. Acta*, 1290 (1996) 121-127.
- 4454 Filhol, O., Baudier, J., Chambaz, E.M. and Cochet, C.: Casein kinase 2 inhibits the renaturation of complementary DNA strands mediated by p53 protein. *Biochem. J.*, 316 (1996) 331-335.
- 4455 Griffiths, G., Garonne, B., Deacon, E., Owen, P., Pongracz, J., Mead, G., Bradwell, A., Watters, D. and Lord, J.: The polyether bistratene A activates protein kinase C- δ and induces growth arrest in HL60 cells. *Biochem. Biophys. Res. Commun.*, 222 (1996) 802-808.
- 4456 Höhnle, K., Ratge, D., Giray, J., Lauk, C., Rose, T., Hellberg, K. and Wisser, H.: Non-isotopic competitive reverse transcription polymerase chain reaction coupled with high performance liquid chromatography to measure β_2 -receptor messenger RNA in human heart. *Eur. J. Clin. Chem. Clin. Biochem.*, 34 (1996) 411-417.
- 4457 Kwok, F., Humpage, A. and Cheng, C.H.K.: Phosphatidylinositol phosphate 5-kinase: purification and inhibition studies. *Prepar. Biochem. Biotechnol.*, 26 (1996) 1-19.
- 4458 Liu, R., Leavis, P. and Badwey, J.A.: *In vitro* activation of a 60-70 kDa histone H4 protein kinase from neutrophils by limited proteolysis. *Biochim. Biophys. Acta*, 1295 (1996) 89-95.
- 4459 Medina, M., García-Rocha, M., Padilla, R., Pérez, M., Montejido de Garcini, E. and Avila, J.: Protein kinases involved in the phosphorylation of human tau protein in transfected COS-1 cells. *Biochim. Biophys. Acta*, 1316 (1996) 43-50.
- 4460 Mottram, J.C. and Grant, K.M.: *Leishmania mexicana* p12^{cks1}a homologue of fission yeast p13^{suc1}, associates with a stage-regulated histone H1 kinase. *Biochem. J.*, 316 (1996) 833-839.
- 4461 Ng, K.P., Kambara, T., Matsuura, M., Burke, M. and Ikebe, M.: Identification of myosin III as a protein kinase. *Biochemistry*, 35 (1996) 9392-9399.

- 4462 Shen, L., Huang, K.-P., Chen, H.-C. and Huang, F.L.: Molecular cloning and characterization of a novel casein kinase II substrate, HASPP28, from rat brain. *Arch. Biochem. Biophys.*, 327 (1996) 131-141.
- 4463 Tamaru, T. and Okada, M.: Purification and characterization of a p13^{Suc-1}-bond serine/threonine kinase that is expressed in mature rat brain. *Eur. J. Biochem.*, 238 (1996) 152-159.
- 4464 Tullius, M.V., Munson, R.S., Jr., Wang, J. and Gibson, B.W.: Purification, cloning, and expression of a cytidine 5'-monophosphate N-acetylneuraminate acid synthetase from *Haemophilus ducreyi*. *J. Biol. Chem.*, 271 (1996) 15373-15380.
- 4465 Udovichenko, I.P., Cunnick, J., Gonzalez, K., Yakhnin, A. and Takemoto, D.J.: Protein kinase C in rod outer segments: effect of phosphorylation of the phosphodiesterase inhibitory subunit. *Biochem. J.*, 317 (1996) 291-295.
- 4466 Wilson, M.P. and Majerus, P.W.: Isolation of inositol 1,3,4-trisphosphate 5/6-kinase, cDNA cloning, and expression of the recombinant enzyme. *J. Biol. Chem.*, 271 (1996) 11904-11910.
- 4467 Yang, L.-M. and Lamppa, G.K.: Rapid purification of a chloroplast nucleoside diphosphate kinase using CoA-affinity chromatography. *Biochim. Biophys. Acta*, 1294 (1996) 99-102.
- 4468 Zhang, Y.-L., Zhou, J.-M. and Tsou, C.-L.: Sequential unfolding of adenylate kinase during denaturation by guanidine hydrochloride. *Biochim. Biophys. Acta*, 1295 (1996) 239-244.

See also 4277, 4322, 4398, 4427.

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

- 4469 Aarsman, A.J., Schalkwijk, C.G., Neys, F.W., Iijima, N., Wherrett, J.R. and van den Bosch, H.: Purification and characterization of Ca²⁺-dependent phospholipases A₂ from rat kidney. *Arch. Biochem. Biophys.*, 331 (1996) 95-103.
- 4470 Bekkers, A.C.A.P.A., Slotboom, A.J., van Willigen, G., Akkerman, J.W.N. and Verheij, H.M.: Targeting of porcine pancreatic phospholipase A₂ to human platelets. Introduction of an RGD sequence and acyl-group by chemical modification. *Eur. J. Biochem.*, 238 (1996) 70-76.
- 4471 Diaz, A.R. and Heredia, C.F.: Purification and characterization of *Artemia* 2',3'-cyclic nucleotide 3'-phosphodiesterase. *Biochim. Biophys. Acta*, 1290 (1996) 135-140.
- 4472 Gordon, R.D., Leighton, I.A., Campbell, D.G., Cohen, P., Creaney, A., Wilton, D.C., Masters, D.J., Ritchie, G.A., Mott, R., Taylor, I.W.F. et al.: Cloning and expression of cytosolic phospholipase A₂ (cPLA₂) and a naturally occurring variant. Phosphorylation of Ser505 of recombinant cPLA₂ by p42 mitogen-activated protein kinase results in an increase in specific activity. *Eur. J. Biochem.*, 238 (1996) 690-697.
- 4473 Higgs, H.N. and Glomset, J.A.: Purification and properties of a phosphatidic acid-prefering phospholipase A₁ from bovine testis. Examination of the molecular basis of its activation. *J. Biol. Chem.*, 271 (1996) 10874-10883.
- 4474 Ichikawa, K., Hirano, K., Ito, M., Tanaka, J., Nakano, T. and Hartshorne, D.J.: Interactions and properties of smooth muscle myosin phosphatase. *Biochemistry*, 35 (1996) 6313-6320.
- 4475 Kabuyama, Y., Nakatsu, N., Homma, Y. and Fujii, Y.: Purification and characterization of the phosphatidylinositol-3,4,5-trisphosphate phosphatases in bovine thymus. *Eur. J. Biochem.*, 238 (1996) 350-356.
- 4476 Kissmehl, R., Treptau, T., Hofer, H.W. and Plattner, H.: Protein phosphatase and kinase activities possibly involved in exocytosis regulation in *Paramecium tetraurelia*. *Biochem. J.*, 317 (1996) 65-76.
- 4477 Kupfer, C. and Kemper, B.: Reactions of mitochondrial cruciform cutting endonuclease 1 (CCE 1) of yeast *Saccharomyces cerevisiae* with branched DNAs *in vitro*. *Eur. J. Biochem.*, 238 (1996) 77-87.
- 4478 Lenhard, J.M., Kassel, D.B., Rocque, W.J., Hamacher, L., Holmes, W.D., Patel, I., Hoffman, C. and Luther, M.: Phosphorylation of a cAMP-specific phosphodiesterase (HSPDE4B2B) by mitogen-activated protein kinase. *Biochem. J.*, 316 (1996) 751-758.
- 4479 Norbeck, J., Pahlman, A.-K., Akhtar, N., Blomberg, A. and Adler, L.: Purification and characterization of two isoenzymes of DL-glycerol-3-phosphatase from *Saccharomyces cerevisiae*. Identification of the corresponding GPP1 and GPP2 genes and evidence for osmotic regulation of Gpp2p expression by the osmosensing mitogen-activated protein kinase signal transduction pathway. *J. Biol. Chem.*, 271 (1996) 13875-13881.
- 4480 Portilla, D. and Dai, G.: Purification of a novel calcium-independent phospholipase A₂ from rabbit kidney. *J. Biol. Chem.*, 271 (1996) 15451-15457.
- 4481 Queiroz, J.A., Garcia, F.A.P. and Cabral, J.M.S.: Hydrophobic interaction chromatography of *Chromobacterium viscosum* lipase on polyethylene glycol immobilized on Sepharose. *J. Chromatogr. A*, 734 (1996) 213-219.
- 4482 Reilly, T.J., Baron, G.S., Nano, F.E. and Kuhlenschmidt, M.S.: Characterization and sequencing of a respiratory burst-inhibiting acid phosphatase from *Francisella tularensis*. *J. Biol. Chem.*, 271 (1996) 10973-10983.
- 4483 Schmidt-Dannert, C., Rúa, M.L., Atomí, H. and Schmid, R.D.: Thermoalkalophilic lipase of *Bacillus thermocatenulatus*. I. Molecular cloning, nucleotide sequence, purification and some properties. *Biochim. Biophys. Acta*, 1301 (1996) 105-114.
- 4484 Uusi-Oukari, M., Ehnholm, C. and Jauhainen, M.: Inhibition of hepatic lipase by m-aminophenylboronate. Application of phenylboronate affinity chromatography for purification of human postheparin plasma lipases. *J. Chromatogr. B*, 682 (1996) 233-242.
- 4485 Waldo, G.L., Paterson, A., Boyer, J.L., Nicholas, R.A. and Harden, T.K.: Molecular cloning, expression and regulatory activity of G_{α11}- and β_γ-subunit-stimulated phospholipase C-β from avian erythrocytes. *Biochem. J.*, 316 (1996) 559-568.
- 4486 Yokoyama, N., Kobayashi, T., Tamura, S. and Sugiya, H.: Purification and characterization of protein phosphatase 2c in rat parotid acinar cells: two forms of Mg²⁺-activated histone phosphatase and phosphorylation of cAMP-dependent protein kinase. *Arch. Biochem. Biophys.*, 331 (1996) 1-8.
- 4487 Zolnierowicz, S., van Hoof, C., Andjelkovic, N., Cron, P., Stevens, I., Merlevede, W., Goris, J. and Hemmings, B.A.: The variable subunits associated with protein phosphatase 2A_o defines a novel multimember family of regulatory subunits. *Biochem. J.*, 317 (1996) 187-194.

See also 4284, 4285, 4452.

20e. Hydrolases, acting on glycosyl compounds (E.C. 3.2.-.-)

- 4488 Biswas, N. and Ghosh, A.K.: Characterisation of an acid trehalase of *Saccharomyces cerevisiae* present in trehalase-sucrase aggregate. *Biochim. Biophys. Acta*, 1290 (1996) 95-100.
- 4489 Gubern, G., Canalias, F., Gella, F.J., Colinet, E., Prifilis, C., Calam, D.H., Ceriotti, F., Dufaux, J., Hadjivassiliou, A.G., Lessinger, J.M., Lorentz, K. and Vassault, A.: Production and certification of an enzyme reference material for pancreatic α -amylase (CRM 476). *Clin. Chim. Acta*, 251 (1996) 145-162.
- 4490 Hamagashira, N., Oku, H., Mega, T. and Hase, S.: Purification and characterization of hen oviduct α 1,2-mannosidase. *J. Biochem. (Tokyo)*, 119 (1996) 998-1003.
- 4491 Kumano, M., Omichi, K. and Hase, S.: Substrate specificity of bovine liver cytosolic neutral α -mannosidase activated by Co^{2+} . *J. Biochem. (Tokyo)*, 119 (1996) 991-997.
- 4492 Mayer, C., Ruffner, H.P. and Rast, D.M.: Assessment of the mode of action of chitinases with anion exchange chromatography/pulsed amperometric detection. *Adv. Chitin Sci.*, 1 (1996) 108-113; *C.A.*, 124 (1996) 336219b.
- 4493 Mercyan and Farley, P.C.: An affinity-based procedure for the purification of chitosanase enzymes. *Biomed. Lett.*, 52 (1995) 59-61; *C.A.*, 125 (1996) 4103h.
- 4494 Rao, M., Khadilkar, S., Bandivadekar, K.R. and Deshpande, V.: Structural environment of an essential cysteine residue of xylanase from *Chainia* sp. (NCL 82.5.1). *Biochem. J.*, 316 (1996) 771-775.
- 4495 So, T., Ueda, T., Abe, Y., Nakamura, T. and Imoto, T.: Situation of monomethoxypolyethylene glycol covalently attached to lysozyme. *J. Biochem. (Tokyo)*, 119 (1996) 1086-1093.
- 4496 Stratilova, E., Misloovicova, D. and Dzuurova, M.: Purification of exopolysaccharonase by affinity chromatography on concanavalin A-bead cellulose. *Biotechnol. Tech.*, 10 (1996) 363-366; *C.A.*, 124 (1996) 336292v.

See also 4032, 4308, 4320.

20f. Other hydrolases

- 4497 Bedi, G.S.: Comparative study of kallikrein-like serine proteinases from rat submandibular glands. *Prepar. Biochem. Biotechnol.*, 26 (1996) 85-104.
- 4498 Bramucci, M., Miano, A., Quassinti, L., Maccari, E., Canofeni, S. and Amici, D.: Purification and characterisation of swine serum proteinase which hydrolyses epidermal inhibitory pentapeptide. *Biochim. Biophys. Acta*, 1290 (1996) 184-190.
- 4499 Fontecha, J., Requena, T. and Swaisgood, H.E.: Affinity chromatography of proteinases using bacitracin immobilized to porous glass beads. *Lett. Appl. Microbiol.*, 22 (1996) 371-374; *C.A.*, 125 (1996) 4707h.
- 4500 Hahn, B.-S., Yang, K.-Y., Park, E.-M., Chang, I.-M. and Kim, Y.-S.: Purification and molecular cloning of calobin, a thrombin-like enzyme from *Akistrodon caliginosus* (Korean viper). *J. Biochem. (Tokyo)*, 119 (1996) 835-843.
- 4501 Huang, K., Takagaki, M., Kani, K. and Ohkubo, I.: Dipeptidyl peptidase II from porcine seminal plasma: purification, characterization, and its homology to granzymes, cytotoxic cell proteinases (CCP 1-4). *Biochim. Biophys. Acta*, 1290 (1996) 149-156.

- 4502 Kato, H. and Minamikawa, T.: Identification and characterization of a rice cysteine endopeptidase that digests glutelin. *Eur. J. Biochem.*, 239 (1996) 310-316.
- 4503 Lang, W., Qin, C., Hill, W.A.G., Lin, S., Khanolkar, A.D. and Makriyannis, A.: High-performance liquid chromatographic determination of anandamide amidase activity in rat brain microsomes. *Anal. Biochem.*, 238 (1996) 40-45.
- 4504 Popovic, T., Puizdar, V., Ritonja, A. and Brzin, J.: Simultaneous isolation of human kidney cathepsins B, H, L and C and their characterisation. *J. Chromatogr. B*, 681 (1996) 251-262.
- 4505 Scholze, H., Frey, S., Cejka, Z. and Bakker-Grunwald, T.: Evidence for the existence of both proteasomes and a novel high molecular weight peptidase in *Entamoeba histolytica*. *J. Biol. Chem.*, 271 (1996) 6212-6216.
- 4506 Troeberg, L., Pike, R.N., Morty, R.E., Berry, R.K., Coetzer, T.H.T. and Lonsdale-Eccles, J.D.: Proteases from *Trypanosoma brucei brucei*. Purification, characterization and interactions with host regulatory molecules. *Eur. J. Biochem.*, 238 (1996) 728-736.
- 4507 Tuteja, N., Phan, T.-N. and Tewari, K.K.: Purification and characterization of a DNA helicase from pea chloroplast that translocates in the 3'- to 5'-direction. *Eur. J. Biochem.*, 238 (1996) 54-63.
- 4508 Völkel, H., Kurz, U., Linder, J., Klumpp, S., Gnau, V., Jung, G. and Schultz, J.E.: Cathepsin L is an intracellular and extracellular protease in *Paramecium tetraurelia*. Purification, cloning, sequencing and specific inhibition by its expressed propeptide. *Eur. J. Biochem.*, 238 (1996) 198-206.
- 4509 Yang, S.J., Jiang, S.S., Tzeng, C.M., Kuo, S.Y., Hung, S.H. and Pan, R.L.: Involvement of tyrosine residue in the inhibition of plant vacuolar H^+ -pyrophosphatase by tetranitromethane. *Biochim. Biophys. Acta*, 1294 (1996) 89-97.

See also 4079, 4261, 4262.

20g. Lyases

- 4510 Arslan, O., Nalbantoglu, B., Demir, N., Ozdemir, H. and Kufrevioglu, O.I.: A new method for the purification of carbonic anhydrase isoenzymes by affinity chromatography. *Turk. J. Med. Sci.*, 26 (1996) 163-166; *C.A.*, 124 (1996) 282818a.
- 4511 Bateson, M., Devenish, R.J., Nagley, P. and Prescott, M.: Entrapment of immobilized metal ion affinity chromatography of assembled yeast mitochondrial ATP synthase containing individual subunits tagged with hexahistidine. *Anal. Biochem.*, 238 (1996) 14-18.
- 4512 Ferrero, M.A., Reglero, A., Fernandez-Lopez, M., Ordas, R. and Rodriguez-Aparicio, L.B.: N-Acetyl-D-neuraminic acid lyase generates the sialic acid for colominic acid biosynthesis in *Escherichia coli* K1. *Biochem. J.*, 317 (1996) 157-165.
- 4513 Toth, M.J., Huwyler, L. and Park, J.: Purification of rat liver mevalonate pyrophosphate decarboxylase. *Prepar. Biochem. Biotechnol.*, 26 (1996) 47-51.

See also 4220, 4427.

20h. Isomerases

- 4514 Loftin, C.D. and Eling, T.E.: Prostaglandin synthase 2 expression in epidermal growth factor-dependent proliferation of mouse keratinocytes. *Arch. Biochem. Biophys.*, 330 (1996) 419-429.

20i. Ligases

- 4515 Gaussian, V., Hue, L., Stalmans, W. and Bollen, M.: Activation of hepatic acetyl-CoA carboxylase by glutamate and Mg²⁺ is mediated by protein phosphatase-2A. *Biochem. J.*, 316 (1996) 217-224.
- 4516 Jitrapakdee, S., Booker, G.W., Cassady, A.I. and Wallace, J.C.: Cloning, sequencing and expression of rat liver pyruvate carboxylase. *Biochem. J.*, 316 (1996) 631-637.
- 4517 Kono, M., Hori, C., Hashimoto, T., Hori, S. and Seyama, Y.: Two distinct long-chain-acyl-CoA synthetases in guinea pig Harderian gland. *Eur. J. Biochem.*, 238 (1996) 104-111.
- 4518 Seignovre, L., Härtlein, M. and Leberman, R.: Asparaginyl-tRNA synthetase from *Thermus thermophilus* HB8. Sequence of the gene and crystallization of the enzyme expressed in *Escherichia coli*. *Eur. J. Biochem.*, 239 (1996) 501-508.

See also 4278.

20j. Complex mixtures and incompletely identified enzymes

- 4519 Carmen, A.A., Rundlett, S.E. and Grundstein, M.: HDA1 and HDA3 are components of a yeast histone deacetylase (HDA) complex. *J. Biol. Chem.*, 271 (1996) 15837-15844.
- 4520 Hradec, J., Franek, F. and Dufek, P.: Purification of cholesterol-esterifying enzymes from rat liver cytosol by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 55-62.
- 4521 Parmentier, C., Leroy, P., Visvikis, A. and Nicolas, A.: Liquid chromatographic methods for the purification and activity measurement of glutathione-related enzymes. *LC-GC Int.*, 9 (1996) 356-372.

21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

See 3846.

21a. Purines, pyrimidines, nucleosides, nucleotides

- 4522 Ashton, D., Ray, A. and Valko, K.: Effect of the eluent pH on the thermospray molecular ion intensity of nucleosides. *J. Chromatogr. A*, 734 (1996) 271-276.
- 4523 Blanco, M.D., García, O., Olmo, R., Teijón, J.M. and Katime, I.: Release of 5-fluorouracil from poly(acrylamide-co-monopropyl itaconate) hydrogels. *J. Chromatogr. B*, 680 (1996) 243-253.
- 4524 Crooke, S.T., Graham, M.J., Zuckerman, J.E., Brooks, D., Conklin, B.S., Cummins, L.L., Greig, M.J., Guinoss, C.J., Kornbrust, D., Manoharan, M., Sasmar, H.M., Schleich, T., Tivel, K.L. and Griffey, R.H.: Pharmacokinetic properties of several novel oligonucleotide analogs in mice. *J. Pharmacol. Exp. Ther.*, 277 (1996) 923-937.
- 4525 Dzido, T.H. and Sory, A.: Computer optimization for RP-HPLC separation of some nucleosides. *Chem. Anal. (Warsaw)*, 41 (1996) 113-120; C.A., 124 (1996) 131130f.
- 4526 Ellenberger, T. and Doublie, S.: Use of perfusion chromatography technology for the rapid purification of synthetic oligonucleotides used in DNA/DNA-binding protein structural studies. *Biochemica*, (1996) 12-13; C.A., 124 (1996) 254927s.

- 4527 Földes-Papp, Z., Birch-Hirschfeld, E., Eickhoff, H., Baumann, G., Peng, W.-G., Biber, T., Seydel, R., Kleinschmidt, A.K. and Seliger, H.: Fractals for multicyclic synthesis conditions of biopolymers. Examples of oligonucleotide synthesis measured by high-performance capillary electrophoresis and ion-exchange high-performance liquid chromatography. *J. Chromatogr. A*, 739 (1996) 431-447.
- 4528 Kanehara, H., Mizuguchi, M. and Makino, K.: Isolation of oligodeoxyribonucleotide phosphorothioate diastereomers by the combination of DEAE ion-exchange and reversed-phase chromatography. *Nucleosides Nucleotides*, 15 (1996) 399-406; C.A., 124 (1996) 290147w.
- 4529 Kuracka, L., Kalnovicova, T., Liska, B. and Turcani, P.: HPLC method for measurement of purine nucleotide degradation products in cerebrospinal fluid. *Clin. Chem. (Washington)*, 42 (1996) 756-760.
- 4530 Litzka, O., Then Bergh, K. and Brakhage, A.A.: The *Aspergillus nidulans* penicillin-biosynthesis gene aat (penDE) is controlled by a CCAAT-containing DNA element. *Eur. J. Biochem.*, 238 (1996) 675-682.
- 4531 Mei, D.A., Gross, G.J. and Nithipatikom, K.: Simultaneous determination of adenosine, inosine, hypoxanthine, xanthine, and uric acid in microdialysis samples using microbore column high-performance liquid chromatography with a diode array detector. *Anal. Biochem.*, 238 (1996) 34-39.
- 4532 Min, Z., Gill, R.D., Cortez, C., Harvey, R.G., Loehler, E.L. and DiGiovanni, J.: Targeted A→T and G→T mutations induced by site-specific deoxyadenosine and deoxyguanosine adducts, respectively, from the (+)-anti-diol epoxide of dibenz[a,j]anthracene in M13mp7L2. *Biochemistry*, 35 (1996) 4128-4138.
- 4533 O'Donoghue, K., Brown, T.A., Carter, J.F. and Evershed, R.P.: Application of high-performance liquid chromatography/mass spectrometry with electrospray ionization to the detection of DNA nucleosides in ancient seeds. *Rapid Commun. Mass Spectrom.*, 10 (1996) 495-500; C.A., 124 (1996) 311494z.
- 4534 Reichelova, V., Albertoni, F. and Liliemark, J.: Determination of 2-chloro-2'-deoxyadenosine nucleotides in leukemic cells by ion-pair high-performance liquid chromatography. *J. Chromatogr. B*, 682 (1996) 115-123.
- 4535 Smirnov, I.P., Ruskey, M.T., Juhasz, P., Takach, E.J., Martin, S.A. and Haff, L.A.: Sequencing oligonucleotides by exonuclease digestion and delayed extraction matrix-assisted laser desorption ionization time-of-flight mass spectrometry. *Anal. Biochem.*, 238 (1996) 19-25.
- 4536 Stefan, T.L., Ingalls, S.T., Gerson, S.L., Willson, J.K.V. and Hoppe, C.L.: Determination of O⁶-benzylguanine in human plasma by reversed-phase high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 331-338.
- 4537 Vanhoutte, K., Joos, P., Lemiere, F., van Dongen, W. and Esmans, E.L.: Comparison of conventional and capillary electrospray liquid chromatography/mass spectrometry and liquid chromatography/tandem mass spectrometry for the detection of 2'-deoxynucleoside-bisphenol A diglycidyl ether adducts. *J. Mass Spectrom.*, Spec. Issue (1995) S143-S152; C.A., 124 (1996) 335047g.
- 4538 Vizirianakis, I.S. and Tsiftsoglou, A.S.: Induction of murine erythroleukemia cell differentiation is associated with methylation and differential stability of poly(A)⁺ RNA transcripts. *Biochim. Biophys. Acta*, 1312 (1996) 8-20.

4539 Yamauchi, T., Ueda, T. and Nakamura, T.: A new sensitive method for determination of intracellular 1- β -D-arabinofuranosylcytosine 5'-triphosphate content in human materials *in vivo*. *Cancer Res.*, 56 (1996) 1800-1804.

4540 Zhao, J. and Fleet, G.H.: Separation of twenty isomers of ribonucleotides and deoxyribonucleotides by reversed-phase ion-pairing high-performance liquid chromatography. *J. Chromatogr. A*, 732 (1996) 271-275.

For additional information see C.A.:
124 (1996) 337327x, 343992b.

See also 3860, 3940, 4437, 4794.

21b. Nucleic acids, RNA

4541 Kimura, K. and Kobayashi, H.: RNA partitioning accompanied by adsorption: high-molecular-mass RNA adsorbed at the interface like a particle. *J. Chromatogr. B*, 680 (1996) 213-219.

4542 Shimogori, T., Kashiwagi, K. and Igarashi, K.: Spermidine regulation of protein synthesis at the level of initiation complex formation of Met-tRNA, mRNA and ribosomes. *Biochem. Biophys. Res. Commun.*, 223 (1996) 544-548.

4543 Wages, J.M., Jr. and Katz, E.D.: The application of HPLC for nucleic acid analysis. In: Katz, E.D. (Editor), *High Perform. Liq. Chromatogr.: Princ. Methods Biotechnol.*, Wiley, Chichester, 1996, pp. 351-379; C.A., 125 (1996) 4631d - a review with 68 refs.

See also 4310.

21c. Nucleic acids, DNA

See 4310, 4543.

22. ALKALOIDS

4544 Gupta, V.D.: Quantitation of papaverine hydrochloride in a discolored injection. *Drug Stab.*, 1 (1996) 132-134; C.A., 124 (1996) 325480d.

4545 Hirayama, F., Namiki, C., Sagara, K., Tong, Y.-Y., He, L.-Y. and Chen, Y.-H.: Determination of lupin alkaloids and pterocarpans in Sophora root by HPLC. *Nat. Med.*, 49 (1995) 317-321; C.A., 124 (1996) 97858a.

4546 Huang, H.-M. and Sun, S.-W.: High-performance liquid chromatographic separation of aporphine alkaloids. *Chin. Pharm. J. (Taipei)*, 47 (1995) 547-553; C.A., 125 (1996) 4701b.

4547 Jenniskens, L.H.D., van Rozendaal, E.L.M., van Beek, T.A., Wiegerinck, P.H.G. and Scheeren, H.W.: Identification of six taxine alkaloids from *Taxus baccata* needles. *J. Natural Prod.*, 59 (1996) 117-123.

4548 Quellet, D.M.-C. and Pollack, G.M.: A pharmacokinetic-pharmacodynamic model of tolerance to morphine analgesia during infusion in rats. *J. Pharmacokin. Biopharm.*, 23 (1995) 531-549.

4549 Rotshteyn, Y. and Weingarten, B.: A highly sensitive assay for the simultaneous determination of morphine, morphine-3-glucuronide, and morphine-6-glucuronide in human plasma by high-performance liquid chromatography with electrochemical and fluorescence detection. *Ther. Drug Monit.*, 18 (1996) 179-188; C.A., 124 (1996) 306361z.

4550 Tsai, T.-H., Tsai, T.-R., Chou, C.-J. and Chen, C.-F.: Determination of dicentrine in rat plasma by high-performance liquid chromatography and its application to pharmacokinetics. *J. Chromatogr. B*, 681 (1996) 277-281.

4551 Xu, A.S., Peng, L.L., Havel, J.A., Petersen, M.E., Fiene, J.A. and Hulse, J.D.: Determination of nicotine and cotinine in human plasma by liquid chromatography-tandem mass spectrometry with atmospheric-pressure chemical ionization interface. *J. Chromatogr. B*, 682 (1996) 249-257.

For additional information see C.A.:
124 (1996) 315240m.

See also 4769, 4826, 4827.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

23a. Porphyrins and other pyrroles

4552 Hahn, M.E. and Chandran, K.: Uroporphyrin accumulation associated with cytochrome P4501A induction in fish hepatoma cells exposed to aryl hydrocarbon receptor agonists, including 2,3,7,8-tetrachlorodibenzo-*p*-dioxin and planar chlorobiphenyls. *Arch. Biochem. Biophys.*, 329 (1996) 163-174.

4553 Owens, J.W., Robins, M., Robinson, R. and Smith, R.: Chromatographic analysis of photodynamically significant porphyrin dimers and trimers. *J. Chromatogr. B*, 682 (1996) 327-336.

See also 4671, 4848.

23c. Indole derivatives and plant hormones (gibberellins)

4554 Clemons, A.A., Geffen, J.F., Otto, J.M., Pratt, K.L. and Harker, C.T.: Dithiothreitol treatment permits measurement of melatonin in otherwise unusable saliva samples. *J. Pineal Res.*, 20 (1996) 21-23; C.A., 124 (1996) 251108q.

4555 García Sánchez F., Navas Díaz, A. and García Pereja, A.: HPLC determination of tryptophan enantiomers with photometric, fluorimetric and diode-laser polarimetric detection. *Chromatographia*, 42 (1996) 494-498.

4556 Huang, T. and Kissinger, P.T.: Liquid chromatographic determination of serotonin in homogenized dog intestine and rat brain tissue using a 2 mm i.d. PEEK column. *Curr. Sep.*, 14 (1996) 114-119; C.A., 124 (1996) 279355s.

4557 Slominski, A., Baker, J., Rosano, T.G., Guisti, L.W., Ermak, G., Grande, M. and Gaudet, S.J.: Metabolism of serotonin to N-acetylserotonin, melatonin, and 5-methoxytryptamine in hamster skin culture. *J. Biol. Chem.*, 271 (1996) 12281-12286.

4558 Vitale, A.A., Ferrari, C., Aldana, H. and Affanni, J.M.: Highly sensitive method for the determination of melatonin by normal-phase high-performance liquid chromatography with fluorometric detection. *J. Chromatogr. B*, 681 (1996) 381-384.

See also 3894, 3919, 4193.

23d. Pyridine derivatives

See 4839, 4848.

23e. Other N-heterocyclic compounds

- 4559 Chaplen, F.W.R., Fahl, W.E. and Cameron, D.C.: Method for determination of free intracellular and extracellular methylglyoxal in animal cells grown in culture. *Anal. Biochem.*, 238 (1996) 171-178.
 4560 Chen, X.B., Matuszewski, W. and Kowalczyk, J.: Determination of allantoin in biological, cosmetic, and pharmaceutical samples. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 628-635.
 4561 Jira, T., Junghänel, J., Theiss, R., Kottke, K., Besch, A., Schopplich, C., Bunke, A., Leuthold, J. and Beyrich, T.: Zur Synthese und HPLC-Trennung atropisomerer und zentral chiraler 3-Aryl-2-mercaptopo- und 3-Aryl-2-alkylthio-4(3H)-chinazolinonderivate an chiralen stationären Phasen. Teil 1: Synthese. *Pharmazie*, 51 (1996) 273-279.
 4562 Jira, T., Schopplich, C., Bunke, A., Leuthold, J., Junghänel, J., Theiss, R., Kottke, K., Besch, A. and Beyrich, T.: Zur Synthese und HPLC-Trennung atropisomerer und zentral chiraler 3-Aryl-2-mercaptopo- und 3-Aryl-2-alkylthio-4(3H)-chinazoliniderivate an chiralen stationären Phasen. Teil 2: Chiral Enantiomerentrennung. *Pharmazie*, 51 (1996) 379-386.

See also 4226, 4758, 4839, 4848.

24. ORGANIC SULPHUR COMPOUNDS (INCL. GLUCOSINOLATES)

- 4563 Maiorino, R.M., Xu, Z.-F. and Aposhian, H.V.: Determination and metabolism of dithiol chelating agents. XVII. In humans, sodium 2,3-dimercapto-1-propanesulfonate is bound to plasma albumin via mixed disulfide formation and is found in the urine as cyclic polymeric disulfides. *J. Pharmacol. Exp. Ther.*, 277 (1996) 375-384.
 4564 Reemtsma, T.: Methods of analysis of polar aromatic sulfonates from aquatic environments. *J. Chromatogr. A*, 733 (1996) 473-489 - a review with 94 refs.

For additional information see C.A.:

124 (1996) 331155t.

See also 3893, 3973, 4660, 4758, 4799, 4848.

25. ORGANIC PHOSPHORUS COMPOUNDS (INCL. SUGAR PHOSPHATES)

See 4123, 4214, 4283, 4647.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

26a. Organometallic compounds

- 4565 Ellend, N., Rohrer, C., Grasserbauer, M. and Broekaert, J.A.C.: Determination of selenite, selenate and selenomethionine by ion chromatography, microwave digestion and HGAs. *Fresenius J. Anal. Chem.*, 356 (1996) 99-101.

For additional information see C.A.:

124 (1996) 331135m.

See also 3849, 4891.

26c. Coordination compounds

- 4566 Götze, H.-J., Jursch, M. and Kahmann, A.: Liquid chromatographic and infrared studies on ethylenediamineplatinum(II) guanosine complexes. *Anal. Chim. Acta*, 324 (1996) 155-162.
 4567 Midorikawa, T. and Tanoue, E.: Extraction and characterization of organic ligands from oceanic water columns by immobilized metal ion affinity chromatography. *Mar. Chem.*, 52 (1996) 157-171; C.A., 124 (1996) 324801x.
 4568 Mishenina, I.V., Shapovalova, E.N., Bol'shova, T.A., Smirnov, P.V. and Shpigun, O.A.: Effect of the nature of the stationary phase on the retention of metal chelates with 2-(2-thiazolylazo)-5-diethylaminophenol in high-performance liquid chromatography. *J. Anal. Chem.*, 51 (1996) 270-276; C.A., 124 (1996) 359295n.
 4569 Starzynski, S. and Maslowska, J.: (High-performance liquid chromatography of metal chelates with derivatives of dialkyldithiocarbamates). *Zesz. Nauk.-Politech. Łódz., Technol. Chem. Spozyw.*, 689 (1994) 97-118; C.A., 123 (1995) 357619b - a review with 59 refs.
 4570 Ye, L. and Lucy, C.A.: Ion chromatographic determination of chelating ligands based on the postcolumn formation of ternary fluorescent complexes. *J. Chromatogr. A*, 739 (1996) 307-315.

See also 3848, 4934, 4944.

27. VITAMINS AND VARIOUS ANIMAL GROWTH FACTORS (NON-PEPTIDIC)

- 4571 Ali, M.S. and Phillippe, E.T.: Simultaneous determination of ascorbic, dehydroascorbic, isoascorbic, and dehydroisoascorbic acids in meat-based food products by liquid chromatography with postcolumn fluorescence detection: a method extension. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 803-808.
 4572 Arella, F., Lahely, S., Bourguignon, J.B. and Hasselmann, C.: Liquid chromatographic determination of vitamin B₁ and B₂ in foods. A collaborative study. *Food Chem.*, 56 (1996) 81-86; C.A., 124 (1996) 341172k.
 4573 Bao, X. and Chen, X.: (Rapid determination of vitamin B₆ in royal jelly and its products by HPLC). *Fenxi Ceshi Xuebao*, 14 (1995) 77-80; C.A., 124 (1996) 315256w.
 4574 Beckman, M.J., Tadikonda, P., Werner, E., Prahl, J., Yamada, S. and DeLuca, H.F.: Human 25-hydroxyvitamin D₃-24-hydroxylase, a multicatalytic enzyme. *Biochemistry*, 35 (1996) 8465-8472.

- 4575 Budin, J.T., Breene, W.M. and Putnam, D.H.: Some compositional properties of seeds and oils of eight amaranthus species. *J. Am. Oil Chem. Anal.*, 73 (1996) 475-481.
- 4576 Choo, Y.M., Ma, A.N., Yahaya, H., Yamauchi, Y., Bounoshita, M. and Saito, M.: Separation of crude palm oil components by semipreparative supercritical fluid chromatography. *J. Am. Oil Chem. Anal.*, 73 (1996) 523-525.
- 4577 Dimitrova, B., Poyrè, M., Guiso, G., Badiali, A. and Caccia, S.: Isocratic reversed-phase liquid chromatography of all-trans-retinoic acid and its major metabolites in new potential supplementary test systems for developmental toxicology. *J. Chromatogr. B*, 681 (1996) 153-160.
- 4578 Jakob, E. and Elmadfa, I.: Application of a simplified HPLC assay for the determination of phylloquinone (vitamin D₁) in animal and plant food items. *Food Chem.*, 56 (1996) 87-91; *C.A.*, 124 (1996) 341173m.
- 4579 Kelly, P., McPartlin, J. and Scott, J.: A combined high-performance liquid chromatographic-microbial assay for serum folic acid. *Anal. Biochem.*, 238 (1996) 179-183.
- 4580 Kurlandsky, S.B., Duell, E.A., Kang, S., Voorhees, J.J. and Fisher, G.J.: Auto-regulation of retinoic acid biosynthesis through regulation of retinol esterification in human keratinocytes. *J. Biol. Chem.*, 271 (1996) 15346-15352.
- 4581 Lehman, P.A. and Franz, T.J.: A sensitive high-pressure liquid chromatography/particle beam/mass spectrometry assay for the determination of all-trans-retinoic acid and 13-cis-retinoic acid in human plasma. *J. Pharm. Sci.*, 85 (1996) 287-290.
- 4582 Masuda, S., Byford, V., Kremer, R., Makin, H.L.J., Kubodera, N., Nishii, Y., Okazaki, A., Okano, T., Kobayashi, T. and Jones, G.: *In vitro* metabolism of the vitamin D analog, 22-oxacalcitriol, using cultured osteosarcoma, hepatoma, and keratinocyte cell lines. *J. Biol. Chem.*, 271 (1996) 8700-8708.
- 4583 Maugle, P.D.: High performance liquid chromatography with ion pairing and enzyme peak shifting for the simultaneous determination of three vitamer C forms. *J. Appl. Ichthyol.*, 11 (1995) 394-396; *C.A.*, 124 (1996) 258761f.
- 4584 Podda, M., Weber, C., Traber, M.G. and Packer, L.: Simultaneous determination of tissue tocopherols, tocotrienols, ubiquinols and ubiquinones. *J. Lipid Res.*, 37 (1996) 893-901.
- 4585 Purcell, A.W. and Wallace, J.C.: The accessibility of the prosthetic group biotin during monomeric avidin affinity chromatography. *Anal. Biochem.*, 238 (1996) 213-216.
- 4586 Ranalli, A. and Angerosa, F.: Integral centrifuges for olive oil extraction. The qualitative characteristics of products. *J. Am. Oil Chem. Anal.*, 73 (1996) 417-422.
- 4587 Romera, J.M., Ramirez, M. and Gil, A.: Determination of pantothenic acid in infant milk formulas by high performance liquid chromatography. *J. Dairy Sci.*, 79 (1996) 523-526; *C.A.*, 125 (1996) 8898u.
- 4588 Shimada, K., Nakatani, I., Saito, K. and Mitamura, K.: Separation and characterization of monoglucuronides of vitamin D₃ and 25-hydroxyvitamin D₃ in rat bile by high-performance liquid chromatography. *Biol. Pharm. Bull.*, 19 (1996) 491-494; *C.A.*, 124 (1996) 336990w.
- 4589 Tzimas, G., Collins, M.D. and Nau, H.: Identification of 14-hydroxy-4,14-retro-retinol as an *in vivo* metabolite of vitamin A. *Biochim. Biophys. Acta*, 1301 (1996) 1-6.
- 4590 Vinas, P., Campillo, N., López-García, I. and Hernández-Coroba, M.: Identification of vitamin B₁₂ analogues by liquid chromatography with electrothermal atomic absorption. *Chromatographia*, 42 (1996) 566-570.
- 4591 Wellik, D.M. and DeLuca, H.F.: Metabolites of all-trans-retinol in day 10 conceptuses of vitamin A-deficient rats. *Arch. Biochem. Biophys.*, 330 (1996) 355-362.
- 4592 Wu, H., Tang, G. and Wang, Y.: (Determination of vitamins in brown rice flour by high-performance liquid chromatography). *Sepu*, 14 (1996) 140-142; *C.A.*, 124 (1996) 315267a.

See also 4004, 4035, 4090, 4163, 4217, 4665, 4870.

28. ANTIBIOTICS

- 4593 Akashi, T., Nefuji, T., Yoshida, M. and Hosoda, J.: Quantitative determination of tautomeric FK506 by reversed-phase liquid chromatography. *J. Pharm. Biomed. Anal.*, 14 (1996) 339-346.
- 4594 Akhtar, M.H. and Croteau, G.: Extraction of salinomycin from finished layers ration by microwave solvent extraction followed by liquid chromatography. *Analyst (Cambridge)*, 121 (1996) 803-806.
- 4595 Ang, C.Y.W., Luo, W., Hanssen, E.B., Jr., Freeman, J.P. and Thompson, H.C., Jr.: Determination of amoxicillin in catfish and salmon tissues by liquid chromatography with precolumn formaldehyde derivatization. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 389-396.
- 4596 Arcelloni, C., Paroni, R., Basile, M., Bonini, P.A. and Vaiani, R.: Ceftazidime kinetics of diffusion in inoculated agar plates. *Antimicrob. Agents Chemother.*, 40 (1996) 1280-1281; *C.A.*, 125 (1996) 4695c.
- 4597 Arisawa, A., Kawamura, N., Narita, T., Kojima, I., Okamura, K., Tsunekawa, H., Yoshioka, T. and Okamoto, R.: Direct fermentative production of acetyllosins by genetically-engineered strains of *Streptomyces fradiae*. *J. Antibiot.*, 49 (1996) 349-354.
- 4598 Augé, V., Grosse, P.-Y., Albert, G., Audran, M. and Bressolle, F.: High-performance liquid chromatographic determination of tazobactam and piperacillin in human plasma and urine. *J. Chromatogr. B*, 682 (1996) 125-136.
- 4599 Ballard, P., Stafford, L.E. and Law, B.: The development and performance of a radioimmunoassay for the analysis of ZM 213,689, the major metabolite of meropenem - a carbapenem antibiotic - in plasma and urine. *J. Pharm. Biomed. Anal.*, 14 (1996) 409-417.
- 4600 Barker, I.K., Crawford, S.M. and Fell, A.F.: Determination of plasma concentrations of epirubicin and its metabolites by high-performance liquid chromatography during a 96-h infusion in cancer chemotherapy. *J. Chromatogr. B*, 681 (1996) 323-329.
- 4601 Bossi, A., Righetti, P.G., Riva, E. and Zerilli, L.: Purification of glycopeptide antibiotics by isoelectric focusing in multicompartment electrolyzers with Immobiline membranes. *Electrophoresis (Weinheim)*, 17 (1996) 1234-1241.
- 4602 Burkhardt, K., Fiedler, H.-P., Grabley, S., Thiericke, R. and Zeeck, A.: New cineromycins and musacins obtained by metabolite pattern analysis of *Streptomyces griseoviridis* (FH-1832). I. Taxonomy, formation, isolation and biological activity. *J. Antibiot.*, 49 (1996) 432-437.

- 4603 Carlucci, G., Palumbo, G. and Mazzeo, P.: Simple and rapid analysis of pefloxacin, fenbufen and felbinac in human plasma using high performance liquid chromatography. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1107-1115.
- 4604 Chen, B., Xia, L., Xia, X. and Zhang, M.: (Determination of mitomycin C in ocular tissues by high performance liquid chromatography). *Fenxi Huaxue*, 24 (1996) 422-425; *C.A.*, 124 (1996) 306374f.
- 4605 Colombo, L., Guglielmi, D., Selva, E., Stella, S., Stradi, R., Sottani, C. and Zerilli, L.F.: Characterization of the antibiotic GE2270 complex by combined liquid chromatography and mass spectrometry. *Rapid Commun. Mass Spectrom.*, 10 (1996) 409-412; *C.A.*, 124 (1996) 225786q.
- 4606 Delépine, B., Hurtaud-Pessel, D.: Multiresidue method for confirmation of macrolide antibiotics in bovine muscle by liquid chromatography/mass spectrometry. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 397-404.
- 4607 Erah, P.O., Barrett, D.A. and Shaw, P.N.: Ion-pair high-performance liquid chromatographic assay method for the assessment of clarithromycin stability in aqueous solution and in gastric juice. *J. Chromatogr. B*, 682 (1996) 73-78.
- 4608 Gee, H.-E., Ho, K.-B. and Tothill, J.: Liquid chromatographic determination of benzylpenicillin and cloxacillin in animal tissues and its application to a study of the stability at -20°C of spiked and incurred residues of benzylpenicillin in bovine liver. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 640-644.
- 4609 He, X., Wang, J., Liu, X. and Chen, X.: High-performance liquid chromatography assay of rifapentine in human serum. *J. Chromatogr. B*, 681 (1996) 412-415.
- 4610 Hosokawa, N., Naganawa, H., Hamada, M., Takeuchi, T., Ikeno, S. and Hori, M.: Hydroxymycotriens A and B, new ansamycin group antibiotics. *J. Antibiot.*, 49 (1996) 425-431.
- 4611 Houglum, J.E. and Tasler, M.K.: Liquid chromatographic assay of tylosin in animal feeds. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 369-374.
- 4612 Kim, H.-S., Hong, Y.-S., Kim, Y.-H., Yoo, O.-J. and Lee, J.-J.: New anthracycline metabolites produced by the aklavinone 11-hydroxylase gene in *Streptomyces galilaeus* ATCC 31133. *J. Antibiot.*, 49 (1996) 355-360.
- 4613 Kitahashi, T. and Ohba, Y.: An automated high-performance liquid chromatographic method for quantitating arbekacin and vancomycin in serum using coupled column chromatography. *Acta Med. Kinki Univ.*, 20 (1995) 91-95; *C.A.*, 124 (1996) 219227s.
- 4614 Kretschmar, M., Nichterlein, T., Hannak, D. and Hof, H.: Effects of amphotericin B incorporated into liposomes and lipid suspensions in the treatment of murine candidiasis. *Arzneim.-Forsch.*, 46 (1996) 711-715.
- 4615 Liu, L., Roets, E., Busson, R., Vankeerberghen, A., Janssen, G. and Hoogmartens, J.: Two novel spiramycins obtained from commercial samples: isolation and elucidation of structure. *J. Antibiot.*, 49 (1996) 398-401.
- 4616 Liu, Z.S., Li, Y.M., Jiang, S.X. and Chen, L.R.: Direct injection analysis of mitomycin C in biological fluids by multidimension high performance liquid chromatography with a micellar mobile phase. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1255-1265.
- 4617 MacNeil, J.D., Martz, V.K., Korsrud, G.O. and Salisbury, C.D.C.: Chlortetracycline, oxytetracycline, and tetracycline in edible animal tissues, liquid chromatographic method: collaborative study. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 405-417.
- 4618 Matsuura, N., Onose, R. and Osada, H.: Morphology reversion activity of phosmidosine and phosmidosine B, a newly isolated derivative, on src transformed NRK cells. *J. Antibiot.*, 49 (1996) 361-365.
- 4619 Mayo, D.J., Tomasella, F.P. and Noroski, J.E.: Direct chiral resolution of 15-deoxyspergualin using a cellobiohydrolase liquid chromatographic column. *J. Pharm. Biomed. Anal.*, 14 (1996) 457-463.
- 4620 Ngoh, M.A.: Determination of tilmicosin in bovine milk by liquid chromatography with ultraviolet detection. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 652-655.
- 4621 Roudaut, B.: High performance liquid chromatography with UV detection and scanning UV confirmation of chloramphenicol in fatty liver. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1097-1105.
- 4622 Santos, M.D.F., Vermeersch, H., Remon, J.P., Schelkens, M., de Backer, P., Ducatelle, R. and Haesebrouck, F.: Validation of a high-performance liquid chromatographic method for the determination of doxycycline in turkey plasma. *J. Chromatogr. B*, 682 (1996) 301-308.
- 4623 Schneider, A., Späth, J., Breiding-Mack, S., Zeeck, A., Grabley, S. and Thiericke, R.: New cineromycins and musacins obtained by metabolite pattern analysis of *Streptomyces griseoviridis* (FH-S 1832). II. Structure elucidation. *J. Antibiot.*, 49 (1996) 438-446.
- 4624 Shibasaki, M., Sugawara, T., Nagai, K., Shimizu, Y., Yamaguchi, H. and Suzuki, K.: YM-47522, a novel antifungal antibiotic produced by *Bacillus* sp. I. Taxonomy, fermentation, isolation and biological properties. *J. Antibiot.*, 49 (1996) 340-344.
- 4625 Storici, P., Tossi, A., Lenarcic, B. and Romeo, D.: Purification and structural characterization of bovine cathelicidins, precursor of antimicrobial peptides. *Eur. J. Biochem.*, 238 (1996) 769-776.
- 4626 Tsou, T.-L., Wu, J.-R. and Wang, T.-M.: The effects on separation of cephalosporins by HPLC with β -cyclodextrin bonded stationary phase. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1081-1095.
- 4627 Tsukuda, E., Tanaka, T., Ochiai, K., Kondo, H., Yoshida, M., Agatsuma, T., Saitoh, Y., Teshiba, S. and Tatsuda, Y.: El-1507-1 and -2, novel interleukin-1 β converting enzyme inhibitors produced by *Streptomyces* sp. E-1507. *J. Antibiot.*, 49 (1996) 333-339.
- 4628 Wang, Q., Stong, J.D., Demontigny, P., Ballard, J.M., Murphy, J.S., Shim, J.-S.K. and Faulkner, A.J.: Identification of the secondary degradates of L-648,548 in an animal health formulation. *J. Pharm. Sci.*, 85 (1996) 446-450.
- 4629 Yamazaki, Y., McEntagart, J., Shinozaki, K. and Yazawa, H.: Kinetics and mechanism of decomposition of cefazolin ester in phosphate buffer solution. *Chem. Pharm. Bull.*, 44 (1996) 599-601.

See also 3991.

29. INSECTICIDES, PESTICIDES AND OTHER AGROCHEMICALS

29a. General techniques

- 4630 Barceló, D. and Alpendurada, M.F.: A review of sample storage and preservation of polar pesticides in water samples. *Chromatographia*, 42 (1996) 704-712 - a review with 35 refs.
- 4631 Farran, A., Ruiz, S., Serra, C. and Aguilar, M.: Comparative study of high-performance liquid chromatography and micellar electrokinetic capillary chromatography applied to the analysis of different mixtures of pesticides. *J. Chromatogr. A*, 737 (1996) 109-116.
- 4632 Ferrer, I. and Barceló, D.: Determination and stability of pesticides in freeze-dried water samples by automated on-line solid-phase extraction followed by liquid chromatography with diode-array detection. *J. Chromatogr. A*, 737 (1996) 93-99.
- 4633 Guenu, S. and Hennion, M.-C.: Evaluation of new polymeric sorbents with high specific surface areas using an on-line solid-phase extraction-liquid chromatographic system for the trace-level determination of polar pesticides. *J. Chromatogr. A*, 737 (1996) 15-24.
- 4634 Hatrik, S. and Tekel, J.: Extraction methodology and chromatography for the determination of residual pesticides in water. *J. Chromatogr. A*, 733 (1996) 217-233 - a review with 125 refs.
- 4635 Kim, H.S. and Lee, D.W.: Application of quantitative structure-retention relationships for reversed-phase liquid chromatographic separation of pesticides. *Anal. Sci.*, 12 (1996) 349-353; *C.A.*, 124 (1996) 281838v.
- 4636 Kiso, Y., Li, H., Shigetoh, K., Kitao, T. and Jinno, K.: Pesticide analysis by high-performance liquid chromatography using the direct injection method. *J. Chromatogr. A*, 733 (1996) 259-265.
- 4637 Liska, I. and Slobodnik, J.: Comparison of gas and liquid chromatography for analysing polar pesticides in water samples. *J. Chromatogr. A*, 733 (1996) 235-258 - a review with 249 refs.
- 4638 Rimkus, G.G., Rummel, M. and Nausch, I.: Gel permeation chromatography-high performance liquid chromatography combination as an automated clean-up technique for the multiresidue analysis of fats. *J. Chromatogr. A*, 737 (1996) 9-14.
- 4639 Schwarzer, C. and Haselwandter, K.: Rapid quantification of the nitrification inhibitor dicyandiamide in soil samples, nutrient media and bacterial cell-free extracts. *J. Chromatogr. A*, 732 (1996) 390-393.
- 4640 Spiiid, N.H. and Køppen, B.: Determination of polar pesticides in ground water using liquid chromatography-mass spectrometry with atmospheric pressure chemical ionization. *J. Chromatogr. A*, 736 (1996) 105-114.
- 4641 Thorpe, S.A. and Reynolds, S.L.: Accreditation in the UK for pesticide residue analysis in foods. *J. Chromatogr. A*, 737 (1996) 3-7 - a review with 4 refs.
- 4642 Viana, E., Redondo, M.J., Font, G. and Moltó, J.C.: Disks versus columns in the solid-phase extraction of pesticides from water. *J. Chromatogr. A*, 733 (1996) 267-274.

For additional information see C.A.:
124 (1996) 310133u, 335025y.

See also 3915, 4668, 4670, 4838, 4846, 4849, 4850.

29b. Chlorinated insecticides

- 4643 Gruber, L., Santl, H. and Seidl, J.: Confirmation of the DB-SMS column and the use in routine dioxin analysis. *Organohalogen Compd.*, 23 (1995) 175-180; *C.A.*, 124 (1996) 277373x.

See also 4638, 4852.

29c. Phosphorus insecticides

- 4644 Goel, S.: Determination of methyl parathion in the liver and kidney of freshwater fish *Channa punctatus* by high-performance liquid chromatography. *Environ. Ecol.*, 13 (1995) 824-826; *C.A.*, 124 (1996) 281273g.
- 4645 Khuhawar, M.Y., Channar, A.H. and Lanjwani, S.N.: Indirect liquid chromatographic determination of malathion based on copper(II) dimethyldithiophosphate complex formation. *Chromatographia*, 42 (1996) 680-682.
- 4646 Molina, C., Grasso, P., Benfenati, E. and Barceló, D.: Automated sample preparation with extraction columns followed by liquid chromatography-ionspray mass spectrometry. Interferences, determination and degradation of polar organophosphorus pesticides in water samples. *J. Chromatogr. A*, 737 (1996) 47-58.
- 4647 Sancho, J.V., Hidalgo, C., Hernandez, F., Lopez, F.J., Hogen-doorn, E.A. and Dijkman, E.: Rapid determination of glyphosate residues and its main metabolite aminomethylphosphonic acid (AMPA) in soil samples by liquid chromatography. *Int. J. Environ. Anal. Chem.*, 62 (1996) 53-63; *C.A.*, 124 (1996) 253236d.

29d. Carbamates

- 4648 Honing, M., Riu, J., Barceló, D., van Baar, B.L.M. and Brinkman, U.A.T.: Determination of ten carbamate pesticides in aquatic and sediment samples by liquid chromatography-ionspray and thermospray mass spectrometry. *J. Chromatogr. A*, 733 (1996) 283-294.
- 4649 Lancas, F.M., Rissato, S.R. and Galhiane, M.S.: Analysis of carbaryl and carbofuran in tobacco samples by HRGC, HPLC and CZE. *J. High Resolut. Chromatogr.*, 19 (1996) 200-206.

For additional information see C.A.:
124 (1996) 315244r.

29e. Herbicides

- 4650 Dean, J.R., Wade, G. and Barnabas, I.J.: Determination of triazine herbicides in environmental samples. *J. Chromatogr. A*, 733 (1996) 295-335 - a review with 109 refs.
- 4651 Gabriel, J., Vekova, J. and Vosahlo, J.: High-performance liquid chromatographic study of the aromatic nitrile metabolism in soil bacteria. *J. Chromatogr. B*, 681 (1996) 191-195.
- 4652 Hogenboom, A.C., Slobodnik, J., Vreuls, J.J., Rontree, J.A., van Baar, B.L.M., Niessen, W.M.A. and Brinkman, U.A.T.: Single short-column liquid chromatography with atmospheric pressure chemical ionization-(tandem) mass spectrometric detection for trace environmental analysis. *Chromatographia*, 42 (1996) 506-514.

- 4653 Lawrence J.F., Ménard, C., Hannion, M.-C., Pichon, V., le Goffic, F. and Durand, N.: Use of immunoaffinity chromatography as a simplified cleanup technique for the liquid chromatographic determination of phenylurea herbicides in plant material. *J. Chromatogr. A*, 732 (1996) 277-281.
- 4654 Sanchez-Rasero, F., Matallo, M., Peña, A., de la Colina, C., Dios, G.C. and Romero, E.: Liquid chromatographic determination of methabenzthiazuron in soil aqueous solutions with photo-diode-array detection. *J. Chromatogr. A*, 733 (1996) 367-370.
- 4655 Sancho, J.V., Hernández, F., López, F.J., Hogendoorn, E.A., Dijkman, E. and van Zoonen, P.: Rapid determination of glufosinate, glyphosate and aminomethylphosphonic acid in environmental water samples using precolumn fluorogenic labeling and coupled-column liquid chromatography. *J. Chromatogr. A*, 737 (1996) 75-83.
- 4656 Schlegel, O., Niessner, R. and Scheunert, I.: High-performance liquid chromatographic determination of ^{14}C -labelled terbutylazine and principal degradates in percolation water and soil extracts from leaching experiments. *J. Chromatogr. A*, 737 (1996) 101-107.
- 4657 Zhou, M., Bramble, F.Q., Devine, T.J. and Norwood, G.I.: Determination of benzulfuron methyl in rice and crayfish by liquid chromatography with column- and eluant-switching system and UV detection. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 791-802.

See also 3855, 4845.

29f. Fungicides

- 4658 Arenas, R.V., Rahman, H. and Johnson, N.A.: Determination of thiobandazole residues in whole citrus fruits by liquid chromatography with fluorescence detection. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 579-582.

29g. Other types of pesticides and various agrochemicals

- 4659 CCobin, J.A. and Johnson, N.A.: Liquid chromatographic method for determination of total avermectin B₁ and 8,9-Z-avermectin B₁ residues in hops. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 503-507.

For additional information see C.A.:
124 (1996) 315272y.

30. SYNTHETIC AND NATURAL DYES

30a. Synthetic dyes

- 4660 Jandera, P., Fischer, J., Stanek, V., Kucerova, M. and Zvonicek, P.: Separation of aromatic sulphonlic acid dye intermediates by high-performance liquid chromatography and capillary zone electrophoresis. *J. Chromatogr. A*, 738 (1996) 201-213.
- 4661 Oxspring, D.A., O'Kane, E., Marchant, R. and Smyth, W.F.: The separation and determination of reactive textile dyes by capillary electrophoresis and high performance liquid chromatography. *Anal. Methods Instrum.*, 1 (1993, Pub. 1994) 196-202; C.A., 123 (1995) 316857j.

See also 4830, 4836, 4880.

30b. Chloroplast and other natural pigments

- 4662 Curtright, R., Rynearson, J.A. and Markwell, J.: Anthocyanins: model compounds for learning about more than pH. *J. Chem. Educ.*, 73 (1996) 306-309; C.A., 124 (1996) 342073r.
- 4663 Edwards, M.R., MacColl, R. and Eisele, L.E.: Some physical properties of an unusual C-phycocyanin isolated from a photosynthetic thermophile. *Biochim. Biophys. Acta*, 1276 (1996) 64-70.
- 4664 Garrido, J.L. and Zapata, M.: Ion-pair reversed-phase high-performance liquid chromatography of algal chlorophylls. *J. Chromatogr. A*, 738 (1996) 285-289.
- 4665 Hebuterne, X., Wang, X.D., Smith, D.E.H., Tang, G. and Russell, R.M.: *In vivo* biosynthesis of retinoic acid from β -carotene involves an excentric cleavage pathway in ferret intestine. *J. Lipid Res.*, 37 (1996) 482-492.
- 4666 Johnston, T.V. and Morris, J.R.: Separation of anthocyanin pigments in wine by low pressure column chromatography. *J. Food Sci.*, 61 (1996) 109-111; C.A., 124 (1996) 230326u.
- 4667 Oba, T., Kobayashi, M., Yoshida, S. and Watanabe, T.: Integrity of chlorophyllous pigments in silica normal-phase HPLC. *Anal. Sci.*, 12 (1996) 281-284; C.A., 124 (1996) 336971r.
- 4668 Önnerfjord, P., Barceló, D., Emnéus, J., Gorton, L. and Marko-Varga, G.: On-line solid-phase extraction in liquid chromatography using restricted access pre-columns for the analysis of s-triazines in humic-containing. *J. Chromatogr. A*, 737 (1996) 35-45.
- 4669 Patzlaff, J.S. and Barry, B.A.: Pigment quantitation and analysis by HPLC reverse phase chromatography: a characterization of antenna size in oxygen-evolving photosystem II preparations from cyanobacteria and plants. *Biochemistry*, 35 (1996) 7802-7811.
- 4670 Pichon, V., Cau Dit Coumes, C., Chen, L., Guenu, S. and Henion, M.-C.: Simple removal of humic and fulvic acid interferences using polymeric sorbents for the simultaneous solid-phase extraction of polar acidic, neutral and basic pesticides. *J. Chromatogr. A*, 737 (1996) 25-33.
- 4671 Rosell-Mele, A. and Maxwell, J.R.: Rapid characterization of metalloporphyrin classes in natural extracts by gel permeation chromatography/atmospheric pressure chemical ionization/mass spectrometry. *Rapid Commun. Mass Spectrom.*, 10 (1996) 209-213; C.A., 124 (1996) 255145x.
- 4672 Tubaro, F., Micossi, E. and Ursini, F.: The antioxidant capacity of complex mixtures by kinetic analysis of crocin bleaching inhibition. *J. Am. Oil Chem. Anal.*, 73 (1996) 173-179.

For additional information see C.A.:
124 (1996) 315241n.

31. PLASTICS AND THEIR INTERMEDIATES

- 4673 Bonfils, F., Achi, A.K., Beuve, J.S., Sylla, X., Don, A.A. and Laigneau, J.C.: Steric exclusion chromatography study of natural rubber films prepared from-fresh field latex. *J. Nat. Rubber Res.*, 10 (1995) 143-153; C.A., 125 (1996) 13043r.

- 4674 Chang, T.T.: New approaches to characterization of melamine resins by LC/MS. *Polym. Prepr.*, 37 (1996) 292-293; C.A., 124 (1996) 318314z.
- 4675 Cheung, P.C., Hsu, S., Tempel, M., Balke, S.T., Li, L., Schunk, T.C., Sosnowski, S. and Winnik, M.A.: Polymer films from size exclusion chromatography using a solvent-evaporating interface: analysis of polymer blends. *J. Polym. Anal. Charact.*, 2 (1996) 271-291; C.A., 124 (1996) 318430j.
- 4676 Cools, P.J.C.H., Maesen, F., Klumperman, B., van Herk, A.M. and German, A.L.: Determination of the chemical composition distribution of copolymers of styrene and butadiene by gradient polymer elution chromatography. *J. Chromatogr. A*, 736 (1996) 125-130.
- 4677 Dawkins, J.V.: Compositional heterogeneity of copolymers by coupled techniques with chromatographic columns and multidetectors. *Polym. Mater. Sci. Eng.*, 69 (1993) 110-111; C.A., 124 (1996) 318326e.
- 4678 Dong, L., Muggli, M.W., Shultz, A.R., Ward, T.C. and McGrath, J.E.: An investigation of non-steric exclusion effects in size exclusion chromatography. *Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.)*, 37 (1996) 481-482; C.A., 124 (1996) 290843v.
- 4679 Gancheva, V.B., Vladimirov, N.G. and Velichkova, R.S.: Chromatographic investigations of polyacetals in the critical range of liquid chromatography. 2. Determination of functionality and molecular weight distributions in α,ω -bis(9-anthrylmethyl) poly(1,3,6-trioxacyclooctane)s obtained by "active chain-end mechanism". *Macromol. Chem. Phys.*, 197 (1996) 1771-1780; C.A., 125 (1996) 11940g.
- 4680 Gloeckner, G.: Solubility and chromatographic separation of styrene/methacrylate copolymers in ternary eluent systems. *Int. J. Polym. Anal. Charact.*, 2 (1996) 237-252; C.A., 124 (1996) 318442q.
- 4681 Guttmann, C.M. and DiMarzio, E.A.: Chromatography of macromolecules at the absorption transition. *Annu. Tech. Conf. Soc. Plast. Eng.*, 53rd (Vol. 2) (1995) 2551-2555; C.A., 124 (1996) 88407a.
- 4682 Hilgers, H. and Riester, M.: (Analysis of solid polymers). *Nachr. Chem. Tech. Lab.*, 44 (1996) M7-M14; C.A., 125 (1996) 11863j - a review with 30 refs.
- 4683 Hreczuch, W. and Szymanowski, J.: Synthesis of surfactants with narrow-range distribution of the polyoxyethylene chain. *J. Am. Oil Chem. Anal.*, 73 (1996) 73-78.
- 4684 Hunkeler, D., Berek, D., Janko, M., Macko, T. and Prudskova, T.: Limiting conditions in the liquid chromatography of polymers. *Polym. Mater. Sci. Eng.*, 69 (1993) 112-113; C.A., 124 (1996) 290768z.
- 4685 Kilz, P., Krueger, R.-P., Much, H. and Schulz, G.: 2-Dimensional chromatography for the deformulaion of complex copolymers. *Polym. Mater. Sci. Eng.*, 69 (1993) 114-115; C.A., 124 (1996) 270769a.
- 4686 Krueger, R.P., Much, H. and Schulz, G.: Determination of polymer heterogeneity by two dimensional orthogonal liquid chromatography. *Int. J. Polym. Anal. Charact.*, 2 (1996) 221-235; C.A., 124 (1996) 318310v.
- 4687 Lesec, J. and Millequant, M.: Analysis of star-branched polymers with triple detection (refractive index, viscometry, light scattering) gel permeation chromatography. *Int. J. Polym. Anal. Charact.*, 2 (1996) 305-321; C.A., 124 (1996) 344623u.
- 4688 Luo, M. and Teraoka, I.: High osmotic pressure chromatography for large-scale fractionation of polymers. *Macromolecules*, 29 (1996) 4226-4233; C.A., 124 (1996) 344631v.
- 4689 Mori, S.: Size exclusion/non-exclusion liquid chromatography for characterization of styrene copolymers. *Polym. Mater. Sci. Eng.*, 69 (1993) 207-208; C.A., 125 (1996) 11861g - a review with 20 refs.
- 4690 Mourey, T.H. and Coll, H.: Size-exclusion chromatography (SEC) with light-scattering detection at two angles. *Polym. Mater. Sci. Eng.*, 69 (1993) 217-218; C.A., 124 (1996) 290771v.
- 4691 Radge, W., Simon, P.F.W. and Mueller, A.H.E.: Estimation of number-average molecular weights of copolymers by gel permeation chromatography-light scattering. *Macromolecules*, 29 (1996) 4926-4930; C.A., 125 (1996) 11950k.
- 4692 Talzi, V.P., Tulaeva, O.V. and Shupletsov, V.G.: (Composition of the product mixture obtained in the synthesis of monochlorodimethyl ether under industrial conditions). *Zh. Prikl. Khim. (S.-Peterburg)*, 68 (1995) 1863-1866; C.A., 124 (1996) 263984k.
- 4693 Wijnhoven, J.E.G.J., Koorn, J.-P., Poppe, H. and Kok, W.T.: Influence of injected mass and ionic strength on retention of water-soluble polymers and proteins in hollow-fibre flow field-flow fractionation. *J. Chromatogr. A*, 732 (1996) 307-315.
- 4694 Willis, J.N. and Wheller, L.: The use of a GPC-FTIR interface for polymer analysis. *Polym. Mater. Sci. Eng.*, 69 (1993) 120-121; C.A., 124 (1996) 344635z.
- 4695 Wright, P. and Beavers, M.S.: Multi-component analysis using GPC. *Polym. Mater. Sci. Eng.*, 69 (1993) 118-119; C.A., 124 (1996) 344634y.
- 4696 Yau, W.W. and Arora, K.S.: Advantages of using both light scattering and viscosity detectors with size exclusion chromatography. *Polym. Mater. Sci. Eng.*, 69 (1993) 210-211; C.A., 124 (1996) 318330b.

For additional information see C.A.:
125 (1996) 11508x, 11939p.

See also 3956, 4006, 4026, 4868.

32. DRUG ANALYSIS

32a. Drug analysis, general techniques

- 4697 Bogusz, M., Hill, D.W. and Rehorek, A.: Comparability of RP-HPLC retention indices of drugs in three databases. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1291-1316.
- 4698 Cserháti, T. and Forgács, E.: Effect of β -cyclodextrin derivatives on the retention of steroid drugs. *J. Chromatogr. B*, 681 (1996) 205-211.
- 4699 Francotte, E.: Chiral chromatography: an essential and versatile and versatile tool in the research and in the development of bioactive compounds. *Chim. Nouv.*, 14 (1996) 1541-1552; C.A., 124 (1996) 299045u - a review with 42 refs.
- 4700 Gagnon, P. and Grund, E.: Large-scale process development for hydrophobic interaction chromatography. Part 3. Factors effecting capacity determination. *BioPharm (Eugene)*, 9 (1996) 34-39; C.A., 124 (1996) 299047w.

- 4701 Lee, C.R., Porziemsky, J.-P., Gaspar, M. and Krstulovic, A.M.: Chromatographic instrumentation and techniques for the quality control of pharmaceutical products. *LC-GC Int.*, 9 (1996) 414-427.
- 4702 Li, Z. and Xu, X.: (Biosample pretreatment method in chromatographic analysis). *Yaowu Fenxi Zazhi*, 16 (1996) 55-59; C.A., 124 (1996) 299044t - a review with 25 refs.
- 4703 Lunte, S.M. and Lunte, C.E.: Microdialysis sampling for pharmacological studies: HPLC and CE analysis. *Adv. Chromatogr.*, 36 (1996) 383-432; C.A., 124 (1996) 219055j - a review with 73 refs.
- 4704 McGrath, G., McClean, S., O'Kane, E., Smyth, W.F. and Tagliaro, F.: Study of the capillary zone electrophoretic behaviour of selected drugs, and its comparison with other analytical techniques for their formulation assay. *J. Chromatogr. A*, 735 (1996) 237-247.

See also 3975, 4198.

32b. Antirheumatics and antiinflammatory drugs

- 4705 Carlucci, G. and Mazzeo, P.: Simultaneous determination of furoprofen and rufloxacin in human plasma by high-performance liquid chromatography. *J. Chromatogr. Sci.*, 34 (1996) 1812-184.
- 4706 Carlucci, G., Mazzeo, P. and Palumbo, G.: Simultaneous determination of rufloxacin, fenbufen and felbinac in human plasma using high-performance liquid chromatography. *J. Chromatogr. B*, 682 (1996) 315-319.
- 4707 Pirkle, W.H. and Liu, Y.: Incremental development of chiral selectors for underivatized profens. *J. Chromatogr. A*, 736 (1996) 31-38.
- 4708 Siluveru, M. and Stewart, J.T.: Determination of fenbufen and its metabolites in serum by reversed-phase high-performance liquid chromatography using solid-phase extraction and on-line post-column ultraviolet irradiation and fluorescence detection. *J. Chromatogr. B*, 682 (1996) 89-94.
- 4709 Vakily, M. and Jamali, F.: Pharmacokinetics of tiaprofenic acid in humans: lack of stereoselectivity in plasma using both direct and precolumn derivatization methods. *J. Pharm. Sci.*, 85 (1996) 638-642.
- 4710 Zylber-Katz, E. and Levy, M.: The determination of aminopyrine and dipyrone metabolites in urine by HPLC. *Comments. Ther. Drug Monit.*, 18 (1996) 103-104; C.A., 124 (1996) 249483q.

See also 3981, 4158, 4259, 4603, 4627, 4782, 4809.

32c. Autonomic and cardiovascular drugs

- 4711 Bald, E., Sypniewski, S., Drzewoski, J. and Stepien, M.: Application of 2-halopyridinium salts as ultraviolet derivatization reagents and solid-phase extraction for determination of captopril in human plasma by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 283-289.
- 4712 Barbato, F., la Rotonda, M.I. and Quaglia, F.: Chromatographic indexes determined on an immobilized artificial membrane (IAM) column as descriptors of lipophilic and polar interactions of 4-phenyldihydropyridine calcium-channel blockers with biomembranes. *Eur. J. Med. Chem.*, 31 (1996) 311-318; C.A., 125 (1996) 200q.

- 4713 Bores, G.M., Huger, F.P., Petko, W., Mutlib, A.E., Camacho, F., Rush, D.K., Selk, D.E., Wolf, V., Kosley, R.W., Jr., Davis, L. and Vargas, H.M.: Pharmacological evaluation of novel Alzheimer's disease therapeutics: acetylcholinesterase inhibitors related to galanthamine. *J. Pharmacol. Exp. Ther.*, 277 (1996) 728-738.
- 4714 Deng, Y., Liu, H., Li, B., Wang, K., Liu, L., Zheng, Y. and Lou, Y.: (Determination of pentoxifylline in plasma by HPLC and study of its pharmacokinetics). *Zhongguo Linchuang Yaolixue Zazhi*, 11 (1995) 107-110; C.A., 124 (1996) 331497f.
- 4715 Doerge, D.R., Churchwell, M.I., Holder, C.L., Rowe, L. and Bajic, S.: Detection and confirmation of β -agonists in bovine retina using LC/APCI-MS. *Anal. Chem.*, 68 (1996) 1918-1923.
- 4716 Du Souich, P., Héroux, L., Maurice, H., Dépôt, M. and Caillé, G.: Lack of presystemic metabolism of nifedipine in the rabbit. *J. Pharmacokin. Biopharm.*, 23 (1995) 567-580.
- 4717 Elghany, M.F.A., Elzeany, B.E., Elkawy, M.A. and Stewart, J.T.: A stability indicating high performance liquid chromatographic assay of isradipine in pharmaceutical preparations. *Anal. Lett.*, 29 (1996) 1157-1165.
- 4718 Fröhlich, L., Pietzyk, B., Smolinka, K. and Göber, B.: Untersuchungen zur biomimetischen Oxidation von Clemastinhydrogenfumarat. *Pharmazie*, 51 (1996) 409-414.
- 4719 Fukami, T., Nihyama, K., Amano, Y., Hisaka, A., Fujino, N., Sawasaki, Y., Ihara, M. and Ishikawa, K.: Cyclic pentapeptide endothelin A receptor antagonists with attenuated *in vivo* clearance. *Chem. Pharm. Bull.*, 44 (1996) 609-614.
- 4720 Gumieniczek, A., Przyborowski, L. and Plizga, J.: Chromatographic analysis (TLC and HPLC) of dilazep and prenylamin. *Acta Pol. Pharm.*, 52 (1995) 451-454; C.A., 124 (1996) 299069e.
- 4721 Hogendoorn, E.A., van Zoonen, P., Polettini, A. and Montagna, M.: Hyphenation of coupled-column liquid chromatography and thermospray tandem mass spectrometry for the rapid determination of β_2 -agonist residues in bovine urine using direct large-volume sample injection. Set-up of single-residue methods for clenbuterol and salbutamol. *J. Mass Spectrom.*, 31 (1996) 418-426; C.A., 124 (1996) 309707c.
- 4722 Iyer, E.K. and Tipnis, H.P.: RP-HPLC determination of bisoprolol from plasma. *East. Pharm.*, 38 (1995) 111-112; C.A., 124 (1996) 306370b.
- 4723 Kondo, T., Yoshida, K., Yoshimura, Y., Motohashi, M. and Tanayama, S.: Disposition of the new angiotensin II receptor antagonist candesartan cilexetil in rats and dogs. *Arzneim.-Forsch.*, 46 (1996) 594-600.
- 4724 Kunicki, P.K. and Sitkiewicz, D.: High performance liquid chromatographic analysis of some antiarrhythmic drugs in human serum using cyanopropyl derivatized silica phase. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1169-1181.
- 4725 Läer, S., Neumann, J., Scholz, H., Uebeler, P. and Zimmermann, N.: Determination of sotalol in human cardiac tissue by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 291-298.
- 4726 Lessen, T. and Zhao, D.-C.: Interactions between drug substances and excipients. 1. Fluorescence and HPLC studies of triazolophthalazine derivatives from hydralazine hydrochloride and starch. *J. Pharm. Sci.*, 85 (1996) 326-329.
- 4727 Li, K., Tan, L. and Yan, W.: (Determination of captopril in human plasma by reverse-phase HPLC). *Zhongguo Yaoyao Zazhi*, 30 (1995) 740-743; C.A., 124 (1996) 219230n.

- 4728 Maier, N.M. and Uray, G.: Efficient high-performance liquid chromatographic enantioseparation of five-membered aryl-substituted lactones and cyclic carbamates on a (R,R)-diaminodihydroethanoanthracene-derived chiral stationary phase. *J. Chromatogr. A*, 740 (1996) 11-19.
- 4729 Mewis, C., Kühlkamp, V., Lindena, I., Risler, T. and Ress, K.: Quantitation of pentosimide and its metabolite by high-pressure liquid chromatography in human serum. *J. Chromatogr. Sci.*, 34 (1996) 161-165.
- 4730 Modamio, P., Lastra, C.F. and Marino, E.L.: Determination of analytical error function for β -blockers as a possible weighting method for the estimation of the regression parameters. *J. Pharm. Biomed. Anal.*, 14 (1996) 401-408.
- 4731 Modamio, P., Lastra, C.F., Montejo, O. and Marino, E.L.: Notes development and validation of liquid chromatography methods for the quantitation of propranolol, metoprolol, atenolol and stability studies. *Int. J. Pharm.*, 130 (1996) 137-140; *C.A.*, 124 (1996) 352882t.
- 4732 Naito, Y., Yoshikawa, T., Iinuma, S., Miyazaki, R., Yagi, N., Yoshida, N., Osumi, T., Hirao, Y. and Kondo, M.: Local gastric and serum concentrations of rebamipide following oral administration to patients with chronic gastritis. *Arzneim.-Forsch.*, 46 (1996) 698-700.
- 4733 Nunoya, K., Yokoi, T., Kimura, K., Kodama, T., Funayama, M., Inoue, K., Nagashima, K., Funae, Y., Shimada, N., Green, C. and Kamataki, T.: (+)-*cis*-3,5-Dimethyl-2-(3-pyridyl) thiazolidin-4-one hydrochloride (SM-12502) as a novel substrate for cytochrome P450 2A6 in human liver microsomes. *J. Pharmacol. Exp. Ther.*, 277 (1996) 768-774.
- 4734 Oravcova, J., Sojkova, D. and Lindner, W.: Comparison of the Hummel-Dreyer method in high-performance liquid chromatography and capillary electrophoresis conditions for study of the interaction of (RS)-, (R)- and (S)-carvediol with isolated plasma proteins. *J. Chromatogr. B*, 682 (1996) 349-357.
- 4735 Paczkowski, D., Dabrowski, R., Sitkiewicz, D. and Sadowski, Z.: Analysis of diltiazem and desacetyldiltiazem in serum by high-performance liquid chromatography. *Pol. J. Pharmacol.*, 47 (1995) 429-434; *C.A.*, 124 (1996) 219210f.
- 4736 Pappas, J.B., Allen, E.M., Ross, M. and Banner, W., Jr.: HPLC micromethod for amrinone and metabolites in patients receiving concurrent cephalosporin therapy. *Clin. Chem. (Washington)*, 42 (1996) 761-765.
- 4737 Pollak, P.T.: A systematic review and critical comparison of internal standards for the routine liquid chromatographic assay of amiodarone and desethylamiodarone. *Ther. Drug Monit.*, 18 (1996) 168-178; *C.A.*, 124 (1996) 306360y.
- 4738 Rey, E., Moynot, A., d'Athis, P., Pello, J.-Y., Maurel, A., Frydman, M.-O., Buisson, C. and Olive, G.: Dialysis clearance of buflomedil in hemodialysed patients. *Arzneim.-Forsch.*, 46 (1996) 492-495.
- 4739 Tanaka, M. and Yamazaki, H.: Direct determination of pantoprazole enantiomers in human serum by reversed-phase high-performance liquid chromatography using a cellulose-based chiral stationary phase and column switching system as a sample cleanup procedure. *Anal. Chem.*, 68 (1996) 1513-1516.
- 4740 Walshe, M., Kelly, M.T. and Smyth, M.R.: Comparison of two extraction methods for determination of propranolol and furosemide in human plasma by mixed-mode chromatography. *J. Pharm. Biomed. Anal.*, 14 (1996) 475-481.

For additional information see *C.A.*:
124 (1996) 270693t.

See also 3891, 3976, 4169, 4809.

32d. Central nervous system drugs

- 4741 Al-Obaid, A.M., Hagga, M.E.M., El-Khawad, I.E. and El-Mahi, O.H.M.: Simultaneous quantitation of some phenothiazine drug substances and their monosulphoxide degrades by high performance liquid chromatography. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1369-1389.
- 4742 Almirall, M., Montana, J., Escribano, E., Obach, R. and Berrozpe, J.D.: Effect of d-limonene, α -pinene and cineole on *in vitro* transdermal human skin penetration of chlorpromazine and haloperidol. *Arzneim.-Forsch.*, 46 (1996) 676-680.
- 4743 Bernardy, J.A., Coleman, K.S., Stehly, G.R. and Gingerich, W.H.: Determination of benzocaine in rainbow trout plasma. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 623-627.
- 4744 Besret, L., Debruyne, D., Rioux, P., Bonvalot, T., Moulin, M., Zarifian, E. and Baron, J.-C.: A comprehensive investigation of plasma and brain regional pharmacokinetics of imipramine and its metabolites during and after chronic administration in the rat. *J. Pharm. Sci.*, 85 (1996) 291-295.
- 4745 Bloemhof, H., Greijndanus, B. and Uges, D.R.A.: (Determination of 10-hydroxycarbazepine in blood by reversed-phase HPLC). *Ziekenhuisfarmacie*, 12 (1996) 54-55; *C.A.*, 124 (1996) 306339y.
- 4746 Coudray, C., Mangournet, C., Bouhadje, S., Faure, H. and Favier, A.: Rapid high-performance liquid chromatographic assay for salicylic acid in plasma without solvent extraction. *J. Chromatogr. Sci.*, 34 (1996) 166-173.
- 4747 Dawidowicz, A.L. and Fijałkowska, A.: Possibilities of propofol analysis in various blood components by means of HPLC. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1423-1435.
- 4748 Duignan, G.M., Miller, J.H.McB. and Skellern, G.G.: Development of a liquid chromatographic method for the control of related substances in chlorprothixene hydrochloride. *J. Pharm. Biomed. Anal.*, 14 (1996) 451-456.
- 4749 Forrest, G., Sills, G.J., Leach, J.P. and Brodie, M.J.: Determination of gabapentin in plasma by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 421-425.
- 4750 Franklin, M., Odontiadis, J. and Clement, E.M.: Determination of sumatriptan succinate in human plasma by high-performance liquid chromatography with coulometric detection and utilization of solid-phase extraction. *J. Chromatogr. B*, 681 (1996) 416-420.
- 4751 Juergens, U.H., May, T.W. and Rambeck, B.: Simultaneous HPLC determination of vigabatrin and gabapentin in serum with automated pre-injection derivatization. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1459-1471.
- 4752 Kusters, E. and Spöndlin, C.: Influence of temperature on the enantioseparation of rolipram and structurally related racemates on Chiracel-OD. *J. Chromatogr. A*, 737 (1996) 333-337.
- 4753 Lin, C.-c., Kim, H.-K. and Parker, D.: Sensitive high-performance liquid chromatographic method for the determination of a benzonaphthazepine antipsychotic agent, SCH 39166, and its active metabolite, SCH 40853, in human plasma and its cross-validation with a gas chromatographic method. *J. Chromatogr. B*, 682 (1996) 309-313.

- 4754 Ma, F. and Lau, C.E.: Determination of midazolam and its metabolites in serum microsamples by high-performance liquid chromatography and its application to pharmacokinetics in rats. *J. Chromatogr. B*, 682 (1996) 109-113.
- 4755 Naidong, W., Pullen, R.H., Arrendale, R.F., Brennan, J.J., Hulse, J.D. and Lee, J.W.: Stereospecific determinations of (\pm)-DU-124884 and its metabolites (\pm)-KC-99048 in human plasma by liquid chromatography. *J. Pharm. Biomed. Anal.*, 14 (1996) 325-337.
- 4756 Niazy, E.M., El-Sayed, Y.M. and Khidr, S.H.: Rapid high-performance liquid-chromatographic analysis of procainamide and N-acetylprocainamide in plasma. *Saudi Pharm. J.*, 4 (1996) 29-35; *C.A.*, 124 (1996) 306340s.
- 4757 Nobilis, M., Pastera, J., Anzenbacher, P., Svoboda, D., Kopecky, J. and Perlik, F.: High-performance liquid chromatographic determination of tramadol in human plasma. *J. Chromatogr. B*, 681 (1996) 177-183.
- 4758 Nochi, S., Yokoyama, Y., Narukawa, M., Ebine, K., Murahashi, M., Kawakami, Y., Asakawa, N. and Sato, T.: Mechanism of inhibition of H^+ - K^+ -ATPase by sodium 2{[4-(3-methoxypropoxy)-3-methylpyridin-2-yl)methylsulfinyl]-1H-benzimidazole (E3810). *Chem. Pharm. Bull.*, 44 (1996) 552-558.
- 4759 Odontiadis, J. and Franklin, M.: Simultaneous quantitation of buspirone and its major metabolite 1-(2-pyrimidinyl)piperazine in human plasma by high-performance liquid chromatography with coulometric detection. *J. Pharm. Biomed. Anal.*, 14 (1996) 347-351.
- 4760 Pearce, R.E., Rodrigues, A.D., Goldstein, J.A. and Parkinson, A.: Identification of the human P450 enzymes involved in lansoprazole metabolism. *J. Pharmacol. Exp. Ther.*, 277 (1996) 805-816.
- 4761 Piperaki, S. and Parissi-Poulou, M.: Evaluation of the chromatographic behaviour of fluoxetine and norfluoxetine using different cyclodextrins as mobile phase additives and fluorimetric detection. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1405-1421.
- 4762 Priston, M.J. and Sewell, G.J.: Novel liquid chromatographic assay for the low-level determination of apomorphine in plasma. *J. Chromatogr. B*, 681 (1996) 161-167.
- 4763 Ratnaraj, N., Doheny, H.C. and Patsalos, P.N.: A micromethod for the determination of the new antiepileptic drug levetiracetam (ucb LO59) in serum or plasma by high performance liquid chromatography. *Ther. Drug Monit.*, 18 (1996) 154-157; *C.A.*, 124 (1996) 306358d.
- 4764 Silver, I.S., Wurm, R.M., Welch, R.M. and Harrelson, J.C.: A high performance liquid chromatographic method for a novel serotonin reuptake inhibitor 5-chloro-2-[{2-(dimethylamino)methyl}phenyl]benzyl alcohol (403U76). *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1117-1126.
- 4765 Tanaka, E., Terada, M., Misawa, S. and Wakasugi, C.: Simultaneous determination of twelve benzodiazepines in human serum using a new reversed-phase chromatographic column on a 2- μ m porous microspherical silica gel. *J. Chromatogr. B*, 682 (1996) 173-178.
- 4766 Tsai, T.H., Hsu, S.Y., Chou, C.J., Tsai, T.R. and Chen, C.F.: Determination of dihydro-5,6-dehydrokawain in rat plasma by HPLC and its pharmacokinetics application. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1127-1137.
- 4767 Upton, R.N., Lundbrook, G.L., Grant, C. and Gray, E.C.: *In vivo* relationships between the cerebral pharmacokinetics and pharmacodynamics of thiopentone in sheep after short-term administration. *J. Pharmacokinet. Biopharm.*, 24 (1996) 1-8.
- 4768 Vaccher, C., Berthelot, P., Flouquet, N., Vaccher, M.-P. and Debaert, M.: Preparative resolution of saclofen and hydroxysaclofen with analytical-scale high-performance liquid chromatography. *J. Chromatogr. A*, 732 (1996) 239-243.
- 4769 Venkateshwaran, T.G., Stewart, J.T. and King, D.T.: HPLC determination of morphine-ondansetron and meperidine-ondansetron mixtures in 0.9% sodium chloride injection. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1329-1338.
- 4770 Wienkers, L.C., Steenwyk, R.C., Sanders, P.E. and Pearson, P.G.: Biotransformation of tirlazad in human: 1. Cytochrome P450 3A-mediated hydroxylation of tirlazad mesylate in human liver microsomes. *J. Pharmacol. Exp. Ther.*, 277 (1996) 982-990.
- 4771 Yamada, S., Tanaka, C., Suzuki, M., Ohkura, T., Kimura, R. and Kawabe, K.: Determination of α_1 -adrenoceptor antagonists in plasma by radioreceptor assay. *J. Pharm. Biomed. Anal.*, 14 (1996) 289-294.
- 4772 Yang, S.K., Tang, R., Yang, T.J., Pu, Q.-L. and Bao, Z.: 2-(Methylamino)-5-chlorobenzophenone imine: a novel product formed in base-catalyzed hydrolysis of diazepam. *J. Pharm. Sci.*, 85 (1996) 745-748.

See also 3855.

32e. Chemotherapeutics (exc. cytostatics and antibiotics)

- 4773 Barbieri, G., Bergamini, C., Ori, E. and Resca, P.: Determination of sulfonamides in meat and meat products. *Ind. Aliment. (Pinerolo)*, 34 (1995) 1273-1276; *C.A.*, 124 (1996) 230304k.
- 4774 Basci, N.E., Bozkurt, A., Kalayci, D. and Kayaalp, S.O.: Rapid liquid chromatographic assay of ciprofloxacin in human aqueous humor. *J. Pharm. Biomed. Anal.*, 14 (1996) 353-356.
- 4775 Doub, W.H., Ruhl, D.D., Hart, B., Mehlis, P.R. and Revelle, L.K.: Gradient liquid chromatographic method for the determination of chlorhexidine and its degradation products in bulk material. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 636-639.
- 4776 Hajee, C.A.J. and Haagsma, N.: Liquid chromatographic determination of mebendazol and its metabolites, aminobendazol and hydroxybendazol in eel muscle tissue. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 645-651.
- 4777 Kumar, G.N., Rodrigues, A.D., Buko, A.M. and Denissen, J.F.: Cytochrome P450-mediated metabolism of the HIV-1 protease inhibitor ritonavir (ABT-538) in human liver microsomes. *J. Pharmacol. Exp. Ther.*, 277 (1996) 423-431.
- 4778 Mansor, S.M., Navaratnam, V., Yahaya, N., Nair, N.K., Wernsdorfer, W.H. and Degen, P.H.: Determination of a new antimalarial drug, benflumetol, in blood plasma by high-performance liquid chromatography. *J. Chromatogr. B*, 682 (1996) 321-325.
- 4779 Nassar, M.I.A.: High performance liquid chromatography and spectrophotometric determination of cefotaxime sodium in bulk and dosage forms. *Bull. Fac. Pharm. (Cairo)*, 33 (1995) 41-45; *C.A.*, 124 (1996) 352857p.

- 4780 Peter, K., Lalezari, J.P. and Gambertoglio, J.G.: Quantification of zidovudine and individual zidovudine phosphates in peripheral blood mononuclear cells by a combined isocratic high performance liquid chromatography radioimmunoassay method. *J. Pharm. Biomed. Anal.*, 14 (1996) 491-499.
- 4781 Schilling, J.B., Cepa, S.P., Menacherry, S.D., Bavda, L.T., Heard, B.M. and Stockwell, B.L.: Liquid chromatography combined with tandem mass spectrometry for the confirmation of sarafloxacin in catfish tissue. *Anal. Chem.*, 68 (1996) 1905-1909.
- 4782 Stalcup, A.M., Gahm, K.H. and Balidueza, M.: Chiral separation of chloroquine using heparin as a chiral selector in high-performance liquid chromatography. *Anal. Chem.*, 68 (1996) 2248-2250.
- 4783 Taylor, R.B., Alexander, C., Nathwani, D. and Zimbler, N.: Determination of proguanil, cycloguanil and 4-chlorophenylbiguanide in saliva and plasma by ion-pairing column switching HPLC. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1317-1328.
- 4784 Ueno, R. and Aoki, T.: High-performance liquid chromatographic method for the rapid and simultaneous determination of sulfamonomethoxine, miloxacin and oxolinic acid in serum and muscle of cultured fish. *J. Chromatogr. B*, 682 (1996) 179-181.
- 4785 Valdes Santurio, J.R. and González Porto, E.: Determination of glibenclamide in human plasma by solid-phase extraction and high-performance liquid chromatography. *J. Chromatogr. B*, 682 (1996) 364-370.
- 4786 Walker, S.T.: Liquid chromatographic determination of nalidixic acid in pharmaceutical preparations. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 431-433.
- See also 3950, 3989, 4705, 4706.
- 32f. Cytostatics
- 4787 Aboleneen, H., Simpson, J. and Backes, D.: Determination of methotrexate in serum by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 317-322.
- 4788 Akimoto, K., Kawai, A. and Ohya, K.: Simultaneous determination of a camptothecin derivative, used as an anticancer drug, and its photodegradation products by high-performance liquid chromatography. *J. Chromatogr. A*, 734 (1996) 401-404.
- 4789 Burns, R.B., Burton, R.W., Albon, S.P. and Embree, L.: Liquid chromatography-mass spectrometry for the detection of platinum antineoplastic complexes. *J. Pharm. Biomed. Anal.*, 14 (1996) 367-372.
- 4790 Cairns, W.R.L., Ebdon, L. and Hill, S.J.: A high performance liquid chromatography - inductively coupled plasma - mass spectrometry interface employing desolvation for speciation studies of platinum in chemotherapy drugs. *Fresenius J. Anal. Chem.*, 355 (1996) 202-208.
- 4791 Corlett, S.A. and Chrystyn, H.: High-performance liquid chromatographic determination of the enantiomers of cyclophosphamide in serum. *J. Chromatogr. B*, 682 (1996) 337-342.
- 4792 Fox, P.A., Lively, J.D., Firth, J.W., Woolfrey, S.G. and Greenslade, D.: A sensitive assay for cyclophosphamide in human plasma utilizing mass spectroscopy. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1047-1059.
- 4793 Marre, F., Sanderink, G.-J., de Sousa, G., Gaillard, C., Martinet, M. and Rahmani, R.: Hepatic biotransformation of docetaxel (Taxotere®) *in vitro*: involvement of the CYP3A subfamily in humans. *Cancer Res.*, 56 (1996) 1296-1302.
- 4794 Martel, P., Petit, I., Pinguet, F., Poujol, S., Astre, C. and Fabbro, M.: Long-term stability of 5-fluorouracil stored in PVC bags and in ambulatory pump reservoirs. *J. Pharm. Biomed. Anal.*, 14 (1996) 395-399.
- 4795 Nobilis, M., Anzenbacher, P., Pastera, J., Svoboda, Z., Kruby, K., Kvetina, J., Ubik, K. and Trejtnar, F.: Study of the biotransformation of a potential benzo[c]fluorene antineoplastic using high-performance liquid chromatography with high-speed-scanning ultraviolet detection. *J. Chromatogr. B*, 681 (1996) 143-151.
- 4796 Salazar, M.L., Pineyro, A. and Waksman, N.: A reverse phase HPLC method for quantification of peroxisomicine and other anthracenoic compounds. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1391-1403.
- 4797 Sparreboom, A., van Tellingen, O., Scherrenburg, E.J., Boesen, J.J.B., Huizing, M.T., Nooitjen, W.J., Versluis, C. and Beijnen, J.H.: Isolation, purification and biological activity of major docetaxel metabolites from human feces. *Drug Metab. Disp.*, 24 (1996) 655-658.
- 4798 Tateishi, T., Nakura, H., Watanabe, M., Tanaka, M., Kumai, T. and Kobayashi, S.: Preliminary examination of the influence of incubation time or cytosolic protein concentration on dihydropyrimidine dehydrogenase activity. *Clin. Chim. Acta*, 252 (1996) 1-9.
- 4799 Vaishnav, Y.N., Pendergrass, J.A., Jr., Clark, E.P. and Swenberg, C.E.: Chromatographic and mass spectral analysis of the radio-protector and chemoprotector S-3-(3-methylaminopropyl-amino)propanethiol (WR-151326) and its symmetrical disulfide (WR-25595501). *J. Pharm. Biomed. Anal.*, 14 (1996) 317-324.
- 4800 Wsól, V., Kvasnickova, E., Szotakova, B. and Hais, I.M.: High-performance liquid chromatographic assay for the separation and characterization of metabolites of the potential cytostatic drug oracine. *J. Chromatogr. B*, 681 (1996) 169-175.
- See also 4616, 4619.
- 32g. Other drug categories
- 4801 Bacolod, M.D., Lopez-Anaya, A., Kamath, B. and Kishore, V.: Studies of the stability of a substituted phosphorothioate using an improved high performance liquid chromatography assay coupled with electrochemical detection. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1277-1289.
- 4802 Bertram, R., Seefeld, V., Gessner, W. and Smith, H.: Aluminum species in antiperspirants. GPC investigations. *SOFW J.*, 122 (1996) 168-171; *C.A.*, 125 (1996) 18644x.
- 4803 Degen, P.H. and Zbinden, P.: Automated quantitative determination of a new polyamine biosynthesis inhibitor (CGP 48 664) and a potential metabolite in human and animal plasma by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 339-345.
- 4804 Forgács, E. and Cserháti, T.: Effect of physicochemical parameters on the retention of some monoamine oxidase inhibitory drugs on a porous graphitized carbon column. *J. Chromatogr. B*, 681 (1996) 197-204.

- 4805 Giunchedi, P., Scalia, S., Maggi, L. and Conte, U.: Ursodeoxycholic acid: improvement of dissolution behavior and its HPLC determination. *Int. J. Phar.*, 130 (1996) 41-47; C.A., 124 (1996) 352466k.
- 4806 Iwasaki, K., Matsuda, H., Shiraga, T., Kawamura, A., Miyazaki, Y., Teramura, Y., Tozuka, Z. and Hata, T.: (Comparison of tacrolimus (FK506) levels determined by three different methods in the rat blood). *Yakubutsu Dotai*, 10 (1995) 837-847; C.A., 124 (1996) 219212h.
- 4807 Jiang, R., Hayden, C.G.J., Prankerd, R.J., Roberts, M.S. and Benson, H.A.E.: High-performance liquid chromatographic assay for common sunscreening agents in cosmetic products, bovine serum albumin solution and human plasma. *J. Chromatogr. B*, 682 (1996) 137-145.
- 4808 Kimiskidis, V.K., Kazis, A.D. and Niopas, I.: Simultaneous determination of dextromethorphan and dextrorphan in human plasma, urine and cerebrospinal fluid by HPLC with fluorescence detection. *J. Liq. Chromatogr. Ref. Technol.*, 19 (1996) 1267-1275.
- 4809 Langner, A., Rentsch, C., Nerlich, C., Rittner, I., Kühn, H., Schewe, T. and Franke, P.: Untersuchungen zur Biotransformation des Lipoxygenasehemmers 5-Hydroxy-5-methyl-laurophenon-oxim (FLM 5011). *Pharmazie*, 51 (1996) 403-409.
- 4810 Liang, Y., Guo, J. and Wu, D.: (High-performance liquid-chromatographic assay of metoclopramide in human plasma). *Jun-shi Yixue Kexueyuan Yuankan*, 19 (1995) 300-302; C.A., 124 (1996) 331498g.
- 4811 Metzger, W. and Reif, K.: Determination of 1,8-dihydroxyanthranoids in senna. *J. Chromatogr. A*, 740 (1996) 133-138.
- 4812 O'Connor, R., O'Sullivan, J.F. and O'Kennedy, R.: Determination of serum and tissue levels of phenazines including clofazimine. *J. Chromatogr. B*, 681 (1996) 307-315.
- 4813 Okuda, T., Yamashita, K. and Motohashi, M.: High-performance liquid chromatography using on-line solid-phase extraction: determination of furosemide in human serum. *J. Chromatogr. B*, 682 (1996) 343-348.
- 4814 Porter, R.S. and Chen, T.K.: High-performance liquid chromatographic analysis of mupirocin in polyethylene glycols 400 and 3350 using dual ultraviolet and evaporative light scattering detection. *J. Chromatogr. A*, 732 (1996) 399-402.
- 4815 Stuppner, H. and Sturm, S.: LC-MS and CZE of dianthrone from *Cassia angustifolia* and *acutifolia*. *Chromatographia*, 42 (1996) 697-703.
- 4816 Tsina, I., Kalooostian, M., Lee, R., Tarnowski, T. and Wong, B.: High-performance liquid chromatographic method for the determination of mycophenolate mofetil in human plasma. *J. Chromatogr. B*, 681 (1996) 347-353.
- 4817 Tsuji, M., Hayashi, M., Matsuoka, M. and Takamatsu, T.: (Determination of sulphur in cosmetic products containing powders by nonsuppressor ion chromatography). *Jpn. J. Toxicol. Environ. Health*, 42 (1996) 96-100; C.A., 124 (1996) 298383r.
- 4818 Tulich, L.J., Randall, J.L., Kelm, G.R. and Wehmeyer, K.R.: Determination of two mebeverine metabolites, mebeverine alcohol and desmethylmebeverine alcohol, in human plasma by a dual stable isotope-based gas chromatographic-mass spectrometric method. *J. Chromatogr. B*, 682 (1996) 273-281.
- 4819 Volmer, D.A., Lay, J.O., Billedeau, M. and Vollmer, D.L.: Characterization of nitrosation products in cosmetics raw materials by liquid chromatography/mass spectrometry techniques. *Rapid Commun. Mass Spectrom.*, 10 (1996) 715-720; C.A., 124 (1996) 324948a.
- 4820 Wang, T., Grinberg, N., Bicker, G., Twy, P. and Thompson, K.: High-performance liquid chromatographic separation of an HIV-1 reverse transcriptase inhibitor and its enantiomer. *J. Chromatogr. A*, 738 (1996) 290-294.
- 4821 Yoshida, S., Namba, R., Takamatsu, T. and Matsuoka, M.: Analysis of cosmetic ingredients by continuous flow fast atom bombardment liquid chromatography-mass spectrometry. *J. Soc. Cosmet. Chem.*, 46 (1995) 329-342; C.A., 124 (1996) 352268x.
- 4822 Zeng, M.-Y., Lu, Z.-L., Yang, S.-C., Zhang, M., Liao, J., Liu, S.-L. and Teng, X.-H.: Determination of benflumetol in human plasma by reversed-phase high-performance liquid chromatography with ultraviolet detection. *J. Chromatogr. B*, 681 (1996) 299-306.
- 4823 Zhong, W.Z. and Williams, M.G.: Simultaneous quantitation of pioglitazone and its metabolites in human serum by liquid chromatography and solid phase extraction. *J. Pharm. Biomed. Anal.*, 14 (1996) 465-473.

For additional information see C.A.:
125 (1996) 18993k.

See also 3979, 4105.

32h. Toxicological and forensic applications

- 4824 Li, S. and Yatscoff, R.W.: Improved high-performance liquid chromatographic assay for the measurement of mycophenolic acid in human plasma. *Transplant. Proc.*, 28 (1996) 938-940; C.A., 125 (1996) 208y.
- 4825 Perrett, D. and White, P.: HPLC in biomedical and forensic analysis. *High Perform. Liq. Chromatogr.*, (1996) 205-233; C.A., 124 (1996) 252779w - a review with 9 refs.
- 4826 Virag, L., Mets, B. and Jamdar, S.: Determination of cocaine, norcocaine, benzoylecgonine and ecgonine methyl ester in rat plasma by high-performance liquid chromatography with ultraviolet detection. *J. Chromatogr. B*, 681 (1996) 263-269.
- 4827 Williams, C.L., Laizure, S.C., Parker, R.B. and Lima, J.J.: Quantitation of cocaine and cocaethylene in canine serum by high-performance liquid chromatography. *J. Chromatogr. B*, 681 (1996) 271-276.

See also 4218, 4537, 4550, 4577, 4697, 4715, 4891.

32i. Plant extracts

- 4828 Nukaya, H., Yamashiro, H., Fukazawa, H., Ishida, H. and Tsuji, K.: Isolation of inhibitors of TPA-induced mouse ear edema from Hoelen, *Poria cocos*. *Chem. Pharm. Bull.*, 44 (1996) 847-849.
- 4829 Parrish, M.: Liquid chromatographic method for determining capsaicinoids in Capsicum and their extractives. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 738-745.
- 4830 Stuppner, H. and Egger, R.: Application of capillary zone electrophoresis to the analysis of betalains from *Beta vulgaris*. *J. Chromatogr. A*, 735 (1996) 409-413.

4831 Wolfender, J.-L., Rodriguez, S., Hostettmann, K. and Wagner-Reedeker, W.: Comparison of liquid chromatography/electrospray, atmospheric pressure chemical ionization, thermospray and continuous-flow fast atom bombardment mass spectrometry for the determination of secondary metabolites in crude plant extracts. *J. Mass Spectrom.*, Spec. Issue (1995) S35-S46; C.A., 124 (1996) 299085g.

4832 Zhang, S. and Ou, Q.: Preparative separation of chemical ingredients from *Podophyllum emodii* var. *Chinensis spragues* by high-speed countercurrent chromatography. *Microchem. J.*, 52 (1995) 155-158; C.A., 123 (1995) 265892g.

For additional information see C.A.:

124 (1996) 287586h, 299091f.

See also 4016, 4099, 4170, 4178, 4179, 4672.

33. CLINICO-CHEMICAL APPLICATIONS

33a. General papers and reviews

See 4058, 4211.

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

4833 Schadewaldt, P., Wendel, U. and Hammel, H.-W.: Determination of R- and S-3-methyl-2-oxopentanoate enantiomers in human plasma: suitable method for label enrichment analysis. *J. Chromatogr. B*, 682 (1996) 209-218.

For additional information see C.A.:

124 (1996) 337301j.

See also 4017, 4160, 4177, 4194, 4195, 4197, 4208, 4210, 4215, 4244, 4344, 4348, 4353, 4356, 4358, 4359, 4360, 4361, 4418, 4529, 4946.

34. FOOD ANALYSIS

See 4035.

34b. Complex mixtures (single compounds by cross-reference only)

4834 Falque Lopez, E. and Fernandez Gomez, E.: Simultaneous determination of the major organic acids, sugars, glycerol, and ethanol by HPLC in grape musts and white wines. *J. Chromatogr. Sci.*, 34 (1996) 254-257.

4835 Joubert, E.: HPLC quantification of the dihydrochalcones, aspalathin and nothofagin in rooibos tea (*Aspalathus linearis*) as affected by processing. *Food Chem.*, 55 (1996) 403-411; C.A., 124 (1996) 315282b.

4836 Lancaster, F.E. and Lawrence, J.F.: High-performance liquid chromatographic separation of carminic acid, α and β -bixin, and α - and β -norbixin, and the determination of carminic acid in foods. *J. Chromatogr. A*, 732 (1996) 394-398.

4837 Mondello, L., Dugo, P., Dugo, G. and Bartle, K.D.: On-line HPL-HRGC-MS for the analysis of natural complex mixtures. *J. Chromatogr. Sci.*, 34 (1996) 174-181.

4838 Obana, H. and Hori, S.: (Latest analytical methods for the residual pesticides in foods). *Jpn. J. Toxicol. Environ. Health*, 42 (1996) 1-16; C.A., 124 (1996) 315195a - a review with 52 refs.

For additional information see C.A.:

124 (1996) 315243q.

See also 3895, 3996, 4010, 4018, 4022, 4028, 4031, 4033, 4043, 4057, 4087, 4092, 4098, 4103, 4106, 4108, 4111, 4112, 4115, 4119, 4120, 4122, 4129, 4140, 4186, 4192, 4199, 4224, 4571, 4572, 4575, 4576, 4578, 4583, 4586, 4587, 4592, 4608, 4611, 4617, 4620, 4621, 4641, 4666, 4773, 4781, 4910, 4927, 4936.

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

4839 Perfett, G.A.: Determination of heterocyclic aromatic amines in process flavors by a modified liquid chromatographic method. *J. Assoc. Off. Anal. Chem.*, 79 (1996) 813-816.

4840 Portela, M.J., de Balugera, Z.G., Aránzazu Goicolea, M. and Barrio, R.J.: Electrochemical study of the flavour enhancer maltol. Determination in foods by liquid chromatography with amperometric detection. *Anal. Chim. Acta*, 327 (1996) 65-71.

For additional information see C.A.:

124 (1996) 230344y.

See also 4092, 4206.

35. ENVIRONMENTAL ANALYSIS

35a. General papers and reviews

4841 Joensson, J.-A. and Marko-Varga, G. (Editors): *7th Symposium on Handling of Environmental and Biological Samples in Chromatography, Held in Lund (Sweden), 8-10 May 1995*. In: *J. Chromatogr. A*, Vol. 725, No. 1, Elsevier, Amsterdam, 1996, 202 pp.

4842 Poole, C.F.: Chromatography in the environment. *LC-GC Int.*, 9 (1996) 274-276.

See also 3957, 3997, 4014, 4872, 4876, 4902, 4944, 4958.

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

4843 Tancell, P.J. and Rhead, M.M.: Application of radio-chromatographic techniques to diesel emissions research. *J. Chromatogr. A*, 737 (1996) 181-192.

See also 4182, 4201, 4903, 4914, 4955, 4957.

- 35c. *Water pollution (complex mixtures; single compounds by cross-reference only)*
- 4844 Biziuk, M. and Przyjazny, A.: Methods of isolation and determination of volatile organohalogen compounds in natural and treated waters. *J. Chromatogr. A.*, 733 (1996) 417-448 - a review with 393 refs.
- 4845 Dupas, S., Scribe, P. and Dubernet, J.F.: On-line and off-line solid-liquid extraction and liquid chromatographic analysis at trace levels, for monitoring of herbicides and their degradation products in river and fluvio-estuarine freshwater-seawater interfaces. *J. Chromatogr. A.*, 737 (1996) 117-126.
- 4846 Font, G., Mañes, J., Molto, J.C. and Picó, Y.: Current developments in the analysis of water pollution by polychlorinated biphenyls. *J. Chromatogr. A.*, 733 (1996) 449-471 - a review with 154 refs.
- 4847 Fung, Y.S., Wu, Z. and Dao, K.L.: Determination of total organic carbon in water by thermal combustion - ion chromatography. *Anal. Chem.*, 68 (1996) 2186-2190.
- 4848 Johansen, S.S., Hansen, A.B., Mosbaek, H. and Arvin, E.: Method development for trace analysis of heteroaromatic compounds in contaminated groundwater. *J. Chromatogr. A.*, 738 (1996) 295-304.
- 4849 Junker-Buchheit, A. and Witzenbacher, M.: Pesticide monitoring of drinking water with the help of solid-phase extraction and high-performance liquid chromatography. *J. Chromatogr. A.*, 737 (1996) 67-74.
- 4850 Kadota, M., Imanaka, M., Ikegawa, K., Kumashiro, K., Mori, T., Suzuki, S. and Makazawa, H.: (Determination of nitrophenol pesticides in mineral water and tap water by HPLC with ultraviolet and amperometric detection). *Shokuhin Eiseigaku Zasshi*, 37 (1996) 48-53; C.A., 124 (1996) 298195f.
- 4851 Kiewiet, A.T. and de Voogt, P.: Chromatographic tools for analyzing and tracking non-ionic surfactants in the aquatic environment. *J. Chromatogr. A.*, 733 (1996) 185-192 - a review with 42 refs.
- 4852 Krahn, M.M., Ylitalo, G.M., Buzitis, J. and Chan, S.L.: Rapid HPLC/PDA analysis of marine fish and invertebrates for dioxin-like and other chlorobiphenyl congeners. *Organohalogen Compd.*, 24(Dioxin 95, 17th International Symposium on Chlorinated Dioxins and Related Compounds, 1995) (1995) 457-461; C.A., 124 (1996) 258974c.
- 4853 Marth, P., Schramm, K.W., Lattmann, L., Oxynos, K. and Kettrup, A.: A new semiautomatic method based on GC/HPLC techniques for GC-ECD and GC-MS analysis of toxaphene in environmental samples. *Organohalogen Compd.*, 26 (1995) 351-356; C.A., 124 (1996) 350942p.
- 4854 Van Berkel, J. and Beckett, R.: Determination of adsorption characteristics of the nutrient orthophosphate to natural colloids by sedimentation field-flow fractionation. *J. Chromatogr. A.*, 733 (1996) 105-117.
- 4855 Wennrich, L., Levin, U., Efer, J. and Engewald, W.: (Analysis of diamino- and aminonitroaromatics in water using solid phase extraction and HPLC). *Wom Waser*, 86 (1996) 341-352; C.A., 124 (1996) 352081f.

For additional information see C.A.:
124 (1996) 298196g, 359366m.

See also 3915, 4008, 4012, 4013, 4084, 4181, 4188, 4564, 4567, 4630, 4633, 4634, 4636, 4637, 4640, 4642, 4646, 4648, 4650, 4652, 4654, 4655, 4656, 4668, 4670, 4857, 4861, 4863, 4909, 4910, 4912, 4923, 4929, 4938, 4940, 4947, 4951, 4952, 4953, 4959.

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

- 4856 Aoyama, M.: Use of high performance size exclusion chromatography to monitor the dynamics of water-soluble organic substances during the decomposition of plant residues in soil. *Soil Sci. Plant Nutr. (Tokyo)*, 42 (1996) 21-30; C.A., 124 (1996) 259574j.

See also 4189, 4639, 4654, 4656, 4945.

36. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

36a. Surfactants

- 4857 Boyd-Boland, A.A. and Pawliszyn, J.B.: Solid-phase microextraction coupled with high-performance liquid chromatography for the determination of alkylphenol ethoxylate surfactants in water. *Anal. Chem.*, 68 (1996) 1521-1529.
- 4858 Jandera, P. and Prokes, B.: Chromatographic behaviour of unsulphated and sulphated oligoethyleneglycol nonylphenyl ether surfactants in normal-phase liquid chromatographic systems containing water. *Chromatographia*, 42 (1996) 539-546.
- 4859 Jandera, P., Urbanek, J., Prokes, B. and Blazkova-Brunova, H.: Chromatographic behaviour of oligoethylene glycol nonylphenyl ether anionic surfactants in normal-phase high-performance liquid chromatography. *J. Chromatogr. A.*, 736 (1996) 131-140.
- 4860 Lemr, K.: Homologue separation of linear alcohol ethoxylates by high-performance liquid chromatography. *J. Chromatogr. A.*, 732 (1996) 299-305.
- 4861 Marcomini, A. and Zanette, M.: Chromatographic determination of non-ionic aliphatic surfactants of the alcohol polyethoxylate type in the environment. *J. Chromatogr. A.*, 733 (1996) 193-206 - a review with 68 refs.
- 4862 Ogura, I., DuVal, D.L., Kawakami, S. and Miyajima, K.: Identification and quantitation of surfactants in consumer products by ion-spray mass spectrometry. *J. Am. Oil Chem. Anal.*, 73 (1996) 137-142.
- 4863 Scullion, S.D., Clench, M.R., Cooke, M. and Ashcroft, A.E.: Determination of surfactants in surface water by solid-phase extraction, liquid chromatography and liquid chromatography-mass spectrometry. *J. Chromatogr. A.*, 733 (1996) 207-216.
- 4864 Simonsick, W.J., Jr. and Prokai, L.: Size exclusion chromatography with electrospray mass spectrometric detection. *Polym. Mater. Sci. Eng.*, 69 (1993) 412-413; C.A., 124 (1996) 292908u.
- 4865 Ye, M., Walkup, R. and Hill, K.: Determination of alkylated and sulfonated diphenyl oxide surfactant by high performance liquid chromatography. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1229-1240.

See also 3961, 4096, 4105, 4683, 4851.

36b. Antioxidants and preservatives

- 4866 Lamarre, C. and Gendron, A.: Analysis of 2,6-di-*tert*-butyl-p-cresol in insulating oils by high-performance liquid chromatography. *IEEE Trans. Dielectr. Insul.*, 2 (1995) 413-417; C.A., 123 (1995) 291304m.
- 4867 Sible, V.S.: Quantitative analysis of a biocide in silicone emulsions using high performance liquid chromatography. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1353-1367.
- 4868 Somsen, G.W., Rozendom, E.J.E., Gooijer, C., Velthorst, N.H. and Brinkman, U.A.T.: Polymer analysis by column liquid chromatography coupled semi-on-line with Fourier transform infrared spectrometry. *Analyst (Cambridge)*, 121 (1996) 1069-1074.
- 4869 Stoyanovsky, D., Goldman, R., Jonnalagadda, S.S., Day, B.W., Claycamp, H.G. and Kagan, V.E.: Detection and characterization of the electron paramagnetic resonance-silant glutathionyl-5,5-dimethyl-1-pyrroline N-oxide adduct derived from redox cycling of phenoxyl radicals in model systems and HL-60 cells. *Arch. Biochem. Biophys.*, 330 (1996) 3-11.
- 4870 Witting, P.K., Westerlund, C. and Stocker, R.: A rapid simple screening test for potential inhibitors of tocopherol-mediated peroxidation of LDL lipids. *J. Lipid Res.*, 37 (1996) 853-867.

For additional information see C.A.:
124 (1996) 306026u.

See also 4202, 4584.

36c. Complex mixtures, technical products and unidentified compounds

- 4871 Allouch, M., Infante, M., Seguer, J., Stebe, M. and Selve, C.: Nonionic amphiphilic compounds from aspartic and glutamic acids as structural mimics of lecithins. *J. Am. Oil Chem. Anal.*, 73 (1996) 87-96.
- 4872 Barnay, G.S. and Cowan, R.G.: Removal of actinides from Hanford Site wastes using an extraction chromatographic resin. In: Schulz, W.W. and Horwitz, E.P. (Editors), *Chem. Pretreat. Nud. Waste Disposal*, (Proc. Am. Chem. Soc. Symp.) 1992, Plenum, New York, 1994, pp. 51-70; C.A., 124 (1996) 100412h.
- 4873 Beck, K.R.: Evaluation of DP finished by chromatographic and spectroscopic methods. *Int. Fiber Sci. Technol. Ser.*, 13 (1996) 237-263; C.A., 124 (1996) 345810q - a review with 73 refs.
- 4874 Chen, C., Gao, J. and Yan, Y.: (An application of liquid chromatography for analysis of coal-derived liquid). *Meitan Zhanhua*, 18 (1995) 45-52; C.A., 124 (1996) 265052d - a review with 45 refs.
- 4875 Harod, A.A., Zhang, S.-F., Johnson, B.R., Bartle, K.D. and Kandiyoti, R.: Solubility limitations in the determination of molecular mass distributions of coal liquefaction and hydrocracking products: 1-methyl-2-pyrrolidone as mobile phase in size exclusion chromatography. *Energy Fuels*, 10 (1996) 743-750; C.A., 124 (1996) 293958x.
- 4876 Heimbach, H., Odoj, R. and Steinmetz, H.-J.: Rapid chemical procedures for radioanalytical waste control (LAW and MAW). *Technol. Programs Radioact. Waste Manage Environ. Restor.*, 2 (1994) 1529-1531; C.A., 123 (1995) 305424q.

- 4877 Qu, X., Huang, L., Burhart, T., Crawford, S.E., Caplan, M.S. and Hsueh, W.: Endotoxin induces PAF production in the rat ileum: quantitation of tissue PAF by an improved method. *Prostaglandins*, 51 (1996) 249-262; C.A., 125 (1996) 6088f.
- 4878 Tran, G., Chen, C. and Miller, R.B.: HPLC method for the determination of EDTA in an ophthalmic cleanser. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1499-1508.
- 4879 Van der Hage, E.R.E. and Boon, J.J.: On-line Curie-point pyrolysis-high-performance liquid chromatographic-mass spectrometric analysis of lignin polymers. *J. Chromatogr. A*, 736 (1996) 61-75.
- 4880 Yang, Y.: Liquid chromatographic technique in textile analysis. *Int. Fiber Sci. Technol. Ser.*, 13 (1996) 207-236; C.A., 124 (1996) 345809w - a review with 77 refs.

See also 3961, 4041, 4117, 4136.

37. CELLS, CELLULAR PARTICLES AND SUPRAMOLECULAR STRUCTURES

- 4881 Laboureau, E., Capiod, J.C., Dessaint, C., Prin, L. and Vijayalakshmi, M.A.: Study of human cord blood lymphocytes by immobilized metal ion affinity partitioning. *J. Chromatogr. B*, 680 (1996) 189-195.
- 4882 Morré, D.M., Sammons, D.W., Yim, J., Bruno, M., Snyder, T., Reust, T., Maianu, L., Garvey, W.T. and Morré, D.J.: Isolation by preparative free-flow electrophoresis and aqueous two-phase partition from rat adipocytes of an insulin-responsive small vesicle fraction with glucose transport activity. *J. Chromatogr. B*, 680 (1996) 201-212.
- 4883 Ollero, M., Muñoz Blanco, T., López-Pérez, M.J. and Cebrian Pérez, J.A.: Surface changes associated with ram sperm cryopreservation revealed by counter-current distribution in an aqueous two-phase system. Effect of different cryoprotectants. *J. Chromatogr. B*, 680 (1996) 157-164.
- 4884 Pérez, M.T., García-Pérez, A.I., Lucas, L. and Sancho, P.: A single partitioning step in aqueous polymer two-phase systems reduces hypotonized rat erythrocyte heterogeneity. *J. Chromatogr. B*, 680 (1996) 183-188.
- 4885 Van Alstine, J.M., Malmsten, M. and Brooks, D.E.: Poly(ethylene glycol) amphiphile adsorption and liposome partition. *J. Chromatogr. B*, 680 (1996) 145-155.
- 4886 Walter, H., Nash, G.B., Ascher, G.S. and Meiselman, H.J.: Surface properties of irreversibly sickled cells differ from those of the bulk of sickle cells. Studies by partitioning in aqueous phase systems. *J. Chromatogr. B*, 680 (1996) 197-200.
- 4887 Zhao, J., Kimura, S. and Imanishi, Y.: Receptor affinity of neurotensin message segment immobilized on liposome. *Biochim. Biophys. Acta*, 1282 (1996) 249-256.

See also 3987, 4124, 4854.

38. INORGANIC COMPOUNDS

38a. Cations

- 4888 Atwood, S.E. and Wallwey, D.D.: Ion chromatographic cation analysis of effluent waters from scale dissolver treatments. *J. Chromatogr. A*, 739 (1996) 265-271.
- 4889 Badawy, N.A.: Anion exchange separation of lead from other elements in nitric acid-organic solvents media. *Al-Azhar J. Pharm. Sci.*, 14 (1994) 164-176; *C.A.*, 124 (1996) 277061u.
- 4890 Berthod, A., Xiang, J., Alex, S. and Gonnet-Gollet, C.: (Counter-current chromatography and reverse micelles for separation and extraction of metallic cations). *Can. J. Chem.*, 74 (1996) 277-286; *C.A.*, 124 (1996) 359300k.
- 4891 Boucher, P., Accominootti, M. and Vallon, J.J.: Arsenic speciation by ion-pair reversed-phase liquid chromatography with coupled amperometric and ultraviolet detection. *J. Chromatogr. Sci.*, 34 (1996) 226-229.
- 4892 Buldini, P.L., Cavalli, S., Mevoli, A. and Milella, E.: Application of ion chromatography to the analysis of high-purity CdTe. *J. Chromatogr. A*, 739 (1996) 131-137.
- 4893 Cheveleva, E.A., Firsova, L.A. and Kharitonov, O.V.: (Separation of gadolinium-153 from irradiated europium targets by a chromatographic method using separated ions). *Radiokhimiya*, 37 (1995) 522-527; *C.A.*, 124 (1996) 272730b.
- 4894 Chuang, J.T. and Lo, J.G.: Extraction chromatographic separation of carrier-free ^{90}Y from $^{90}\text{Sr}/^{90}\text{Y}$ generator by crown ether-coated silica gels. *J. Radioanal. Nud. Chem.*, 204 (1996) 83-93; *C.A.*, 124 (1996) 326942t.
- 4895 Corr, J.J. and Analecto, J.F.: Analysis of inorganic species by capillary electrophoresis-mass spectrometry and ion exchange chromatography-mass spectrometry using an ion spray source. *Anal. Chem.*, 68 (1996) 2155-2163.
- 4896 Dietz, M.L. and Horwitz, E.P.: An improved method for the separation of lead-210 from Ra-DEF for radioactive equilibrium experiments. Microscale liquid-liquid extraction using a polymer-supported crown ether. *J. Chem. Educ.*, 73 (1996) 182-184; *C.A.*, 124 (1996) 231354p.
- 4897 Fritz, J.S., Freeze, R.C., Thornton, M.J. and Gjerde, D.T.: Methods for concentrating metal ions prior to analysis by ion chromatography or capillary electrophoresis. *J. Chromatogr. A*, 739 (1996) 57-61.
- 4898 Furuta, N. and Shinofuji, T.: Determination of different oxidation states of arsenic and selenium by inductively coupled plasma-atomic emission spectrometry with ion chromatography. *Fresenius J. Anal. Chem.*, 355 (1996) 457-460.
- 4899 Hao, F., Paull, B. and Haddad, P.R.: Determination of thorium and uranyl in nitrophosphate solution by on-line matrix-elimination reversed-phase chromatography. *Chromatographia*, 42 (1996) 690-696.
- 4900 Hao, F., Paull, B. and Haddad, P.R.: Retention behaviour of thorium(IV) and uranyl on a reversed-phase column with glycolate and mandelate as eluents. *J. Chromatogr. A*, 739 (1996) 151-161.
- 4901 Heltai, G., Jozsa, T. and Peresich, K.: A possibility of element specific detection in HPLC by means of MIP-AES coupled with hydraulic high pressure nebulization. *Fresenius J. Anal. Chem.*, 355 (1996) 638-641.
- 4902 Hoshino, H. and Yotsuyanagi, T.: Kinetic differentiation mode high-performance liquid chromatography as a powerful tool in environmental trace metal chemistry. In: *Adv. Technol. I M, Conf. Proc.*, 10th, 1994, IEEE, New York, 1994, pp. 8-11; *C.A.*, 123 (1995) 245469w.
- 4903 Hoshino, H., Nomura, T., Nakano, K. and Yotsuyanagi, T.: Complexation of Be(II) ion with 1-(2,4-dihydroxy-1-phenylazo)-8-hydroxy-3,6-naphthalenedisulfonate as the chemical basis of the selective detection of ultratrace Be by reversed-phase high-performance liquid chromatography. *Anal. Chem.*, 68 (1996) 1960-1965.
- 4904 Inoue, Y., Kumagai, H., Shimomura, Y., Yokoyama, T. and Suzuki, T.M.: Ion chromatographic separation of rare-earth elements using a nitrilotriacetate-type chelating resin as the stationary phase. *Anal. Chem.*, 68 (1996) 1517-1520.
- 4905 Kaiser, E., Rivello, J., Rey, M., Statler, J. and Heberling, S.: Determination of trace level ions by high-volume direct-injection ion chromatography. *J. Chromatogr. A*, 739 (1996) 71-79.
- 4906 Lo, J.-G. and Chuang, J.T.: Generation of yttrium-90 from strontium-90. *U.S. US 5,508,011 (Cl. 423-2; C01F13/00)*, 16 Apr. 1996, Appl. 449,491, 24 May 1995; 5 p.; *C.A.*, 124 (1996) 327089g.
- 4907 Maihara, V.A., Gallorini, M. and Vasconcellos, M.B.A.: Radiochemical separation for the certification of some trace elements in biological reference materials by neutron activation analysis. *J. Radioanal. Nud. Chem.*, 198 (1995) 343-348; *C.A.*, 124 (1996) 225625m.
- 4908 Marchante-Gayón, J.M., Gonzalez, J.M., Fernández, M.L., Blanco, E. and Sanz-Mendel, A.: Selenium speciation by coupling vesicle mediated HPLC with off-line ETAAS and on-line focused microwave digestion HG-AAS. *Fresenius J. Anal. Chem.*, 355 (1996) 615-622.
- 4909 Motellier, S. and Pitsch, H.: Simultaneous analysis of some transition metals at ultra-trace level by ion-exchange chromatography with on-line preconcentration. *J. Chromatogr. A*, 739 (1996) 119-130.
- 4910 Nagaosa, Y. and Kimata, Y.: High-performance liquid chromatography with electrochemical detection for the determination of vanadium(V) in river water and mussel samples. *Anal. Chim. Acta*, 327 (1996) 203-209.
- 4911 Pantsar-Kalio, M. and Manninen, P.K.G.: Speciation of chromium by coupled column HPLC-ICP-MS - the effects of interfering. *Fresenius J. Anal. Chem.*, 355 (1996) 716-718.
- 4912 Paull, B. and Jones, P.: A comparative study of the metal selective properties of chelating dye impregnated resins for the ion chromatographic separation of trace metals. *Chromatographia*, 42 (1996) 528-538.
- 4913 Pobozny, E., Wojasinska, E. and Trojanowicz, M.: Ion chromatographic speciation of chromium with diphenylcarbazide-based spectrophotometric detection. *J. Chromatogr. A*, 736 (1996) 141-150.
- 4914 Rahmalan, A., Zahari Abdullah, M., Marisn Sanagi, M. and Rashid, M.: Determination of heavy metals in air particulate matter by ion chromatography. *J. Chromatogr. A*, 739 (1996) 233-239.
- 4915 Rogers, R.D. and Bauer, C.B.: Partitioning behavior of Group 1 and 2 cations in poly(ethylene glycol)-based aqueous biphasic systems. *J. Chromatogr. B*, 680 (1996) 237-241.

- 4916 Rogers, R.D. and Zhang, J.: Effects of increasing polymer hydrophobicity on distribution ratios of TcO_4^- in polyethylene/poly(propylene glycol)-based aqueous biphasic systems. *J. Chromatogr. B*, 680 (1996) 231-236.
- 4917 Rogers, R.D., Bond, A.H., Bauer, C.B., Zhang, J. and Griffin, S.T.: Metal ion separations in polyethylene glycol-based aqueous biphasic systems: correlation of partitioning behavior with available thermodynamic hydration data. *J. Chromatogr. B*, 680 (1996) 221-229.
- 4918 Röllin, S., Kopatjic, Z., Wernli, B. and Magyar, B.: Determination of lanthanides and actinides in uranium materials by high-performance liquid chromatography with inductively coupled plasma mass spectrometric detection. *J. Chromatogr. A*, 739 (1996) 139-149.
- 4919 Schöppenthau, J., Nölte, J. and Dunemann, L.: High-performance liquid chromatography coupled with array inductively coupled plasma optical emission spectrometry for the separation and simultaneous detection of metal and non-metal species in soybean. *Analyst (Cambridge)*, 121 (1996) 845-852.
- 4920 Schwedt, G. and Rieckhoff, M.: Separation of thio- and oxothiarsenates by capillary zone electrophoresis and ion chromatography. *J. Chromatogr. A*, 736 (1996) 341-350.
- 4921 Shah, R. and Devi, S.: Dithizone-anchored poly(vinylpyridine) as a chelating resin for the preconcentration and separation of gold(III) from platinum(IV), copper(II) and mercury(II). *Analyst (Cambridge)*, 121 (1996) 807-811.
- 4922 Sikovec, M., Novic, M. and Franko, M.: Application of thermal lens spectrometric detection to the determination of heavy metals by ion chromatography. *J. Chromatogr. A*, 739 (1996) 111-117.
- 4923 Singh, R.P. and Abbas, N.M.: Suppressed ion chromatographic determination of lithium, sodium, ammonium and potassium concentrations in sub-surface brines. *J. Chromatogr. A*, 733 (1996) 93-99.
- 4924 Sui, X., Wang, Z. and Shao, B.: Extraction chromatography-spark source mass spectrometric determination of 14 rare earth impurities in high purity rare earth oxide. *Anal. Sci. Technol.*, 8 (1995) 553-559; *C.A.*, 124 (1996) 277120n.
- 4925 Sutton, R.M.C., Hill, S.J. and Jones, P.: Comparison of the chelating ion exchange properties of dye coated cellulose and polystyrene substrates for the separation and determination of trace metals from aqueous media. *J. Chromatogr. A*, 739 (1996) 81-86.
- 4926 Tokuda, T.: Simultaneous determination of anions and cations. *Jpn. Kokai Tokkyo Koho* JP 08 75,720 [96,75,720] (Cl. G01N30/46), 22 Mar. 1996, Appl. 94/214,860, 8 Sep. 1994; 5 p.; *C.A.*, 124 (1996) 331102y.
- 4927 Trifirò, A., Saccani, G., Zanotti, A., Gherardi, S., Cavalli, S. and Reschiotto, C.: Determination of cations in fruit juices and purées by ion chromatography. *J. Chromatogr. A*, 739 (1996) 175-181.
- 4928 Wang, Q., Tsuoda, K.-i., Akaiwa, H., Yang, L., Ma, H., Li, Y. and Peng, C.: Extraction chromatographic behavior of yttrium and lanthanides in the petroleum sulphoxide-ammonium thiocyanate system. *Anal. Sci.*, 12 (1996) 231-236; *C.A.*, 124 (1996) 330878u.
- 4929 Welch, K.A., Lyons, W.B., Graham, E., Neumann, K., Thomas, J.M. and Mikesell, D.: Determination of major element chemistry in terrestrial waters from Antarctica by ion chromatography. *J. Chromatogr. A*, 739 (1996) 257-263.

For additional information see C.A.:

124 (1996) 277225a, 305724h, 305732j, 305833t, 311500y.

See also 3848, 3903, 3933, 3948, 3952, 3960, 4190, 4570, 4790, 4872, 4931, 4959.

38b. Anions

- 4930 Baluyot, E.S. and Hartford, C.G.: Comparison of polyphosphate analysis by ion chromatography and by modified end-group titration. *J. Chromatogr. A*, 739 (1996) 217-222.
- 4931 Baldini, P.L., Cavalli, S. and Mevoli, A.: Sample pretreatment by UV photolysis for the ion chromatographic analysis of plant material. *J. Chromatogr. A*, 739 (1996) 167-173.
- 4932 Chen, J.: Determination of organic acids in industrial streams by ion chromatography after solid-phase extraction. *J. Chromatogr. A*, 739 (1996) 273-280.
- 4933 Colina, M., Ledo, H., Gutiérrez, E., Villalobos, E. and Marín, J.: Determination of total phosphorus in sediments by means of high-pressure bombs and ion chromatography. *J. Chromatogr. A*, 739 (1996) 223-227.
- 4934 Cox, J.A., Novak, H.L. and Montgomery, R.M.: High-performance liquid chromatographic determination of cyanide using a pre-column conversion to a transition metal complex. *J. Chromatogr. A*, 739 (1996) 229-232.
- 4935 Crowther, D., Monaghan, J.M., Cook, K. and Gara, D.: Nitrate and nitrite determination in complex matrixes by gradient ion chromatography. *Anal. Commun.*, 33 (1996) 51-52; *C.A.*, 124 (1996) 225406r.
- 4936 Ferrara, L., Forgione, P., Schettino, O. and Montesano, D.: (The temperature effect on the separation of NO_3^- and PO_4^{3-} in ionic HPLC). *Riv. Sci. Aliment.*, 25 (1996) 23-26; *C.A.*, 125 (1996) 4708j.
- 4937 Fung, Y.S. and Tam, W.M.: Indirect fluorometric detection for non-suppressed ion chromatographic separation of analyte anions using ruthenium(II) complex as ion-interaction reagent. *Anal. Chim. Acta*, 326 (1996) 67-76.
- 4938 Hallivell, D.J., McKelvie, I.D., Hart, B.T. and Dunhill, R.H.: Separation and detection of condensed phosphates in waste water by ion chromatography coupled with flow injection. *Analyst (Cambridge)*, 121 (1996) 1089-1093.
- 4939 Killgore, J.K. and Villaseñor, S.R.: Systematic approach to generic matrix elimination via "heart-cut" column-switching techniques. *J. Chromatogr. A*, 739 (1996) 43-48.
- 4940 Ledo de Medina, H., Gutiérrez, E., Colina de Vargas, M., González, G., Marín, J. and Andueza, E.: Determination of phosphate and sulphite in natural waters in the presence of high sulphate concentrations by ion chromatography under isocratic conditions. *J. Chromatogr. A*, 739 (1996) 207-215.
- 4941 Michigami, Y., Morooka, M. and Ueda, K.: Determination of sulphite and sulphate by ion chromatography using a weakly basic phthalate eluent. *J. Chromatogr. A*, 732 (1996) 403-407.
- 4942 Nair, L.M., Kildew, B.R. and Saari-Nordhaus, R.: Enhancing the anion separations on a polydivinylbenzene-based anion stationary phase. *J. Chromatogr. A*, 739 (1996) 99-110.
- 4943 Novic, M., Divjak, B., Pihlar, B. and Hudnik, V.: Influence of the sample matrix composition on the accuracy of the ion chromatographic determination of anions. *J. Chromatogr. A*, 739 (1996) 35-42.

- 4944 Otu, E.O., Byerley, J.J. and Robinson, C.W.: Ion chromatography of cyanide and metal cyanide complexes: a review. *Int. J. Environ. Anal. Chem.*, 63 (1996) 81-90; C.A., 124 (1996) 359196f - a review with 74 refs.
- 4945 Pichtel, J., Gierke, T.L. and Scheidler, D.A.: Determination of cyanide in soils and wastes by ion chromatography. *Proc. Indiana Acad. Sci.*, 104 (1995) 241-247; C.A., 124 (1996) 35167p.
- 4946 Radisavljevic, Z., George, M., Dries, D.J. and Gamelli, R.L.: Determination of intracellular and extracellular nitrite and nitrate by anion chromatography. *J. Liq. Chromatogr. Rel. Technol.*, 19 (1996) 1061-1079.
- 4947 Singh, R.P., Abbas, N.M. and Smesko, S.A.: Suppressed ion chromatographic analysis of anions in environmental waters containing high salt concentrations. *J. Chromatogr. A*, 733 (1996) 73-91 - a review with 98 refs.
- 4948 Slingsby, R.W. and Pohl, C.A.: Approaches to sample preparation for ion chromatography. Sulfate precipitation on barium-form ion exchangers. *J. Chromatogr. A*, 739 (1996) 49-55.
- 4949 Sopok, S.: Improved statistical analysis of ion chromatography data from acids for aluminum anodizing solutions. *J. Chromatogr. A*, 739 (1996) 163-166.
- 4950 Sule, P.A. and Ingle, J.D., Jr.: Determination of the speciation of chromium with an automated two-column ion-exchange system. *Anal. Chim. Acta*, 326 (1996) 85-93.
- 4951 Tanner, P.A. and Chan, S.M.: Application of ion chromatography to the Hong Kong rainfall monitoring program. *J. Chromatogr. A*, 739 (1996) 249-256.
- 4952 Van den Hoop, M.A.G.T., Cleven, R.F.M.J., van Staden, J.J. and Neele, J.: Analysis of fluoride in rain water. Comparison of capillary electrophoresis with ion chromatography and ion-selective electrode potentiometry. *J. Chromatogr. A*, 739 (1996) 241-248.
- 4953 Vanatta, L.E.: Quantitation of anions at parts-per-trillion levels in semiconductor pure water by means of a laboratory ion chromatograph. *J. Chromatogr. A*, 739 (1996) 199-205.
- 4954 Zein, R., Munaf, E., Takeuchi, T. and Miwa, T.: Signal enhancement of inorganic anions by indirect photometric detection with anthraquinone-disulfonate as visualization agent in liquid chromatography. *Chromatographia*, 42 (1996) 591-592.
- See also 3848, 3952, 4098, 4565, 4817, 4889, 4895, 4905, 4926, 4929.
- 38d. *Volatile inorganic compounds*
- 4955 Lammel, G.: Sensitive method for the determination of different S(IV) species in cloud and fog water. *Fresenius J. Anal. Chem.*, 356 (1996) 107-108.
- 4956 Nonomura, M., Hobo, T., Kobayashi, E., Murayama, T. and Satoda, M.: Ion chromatographic determination of nitrogen monoxide and nitrogen dioxide after collection in absorption bottles. *J. Chromatogr. A*, 739 (1996) 301-306.
- 4957 Velásquez, H., Ramírez, H., Diaz, J., González de Nava, M., Sosa de Borrego, B. and Morales, J.: Determination of atmospheric sulfur dioxide by ion chromatography in the city of Cabimas, Venezuela. *J. Chromatogr. A*, 739 (1996) 295-299.
39. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS
- 4958 Alfaro-Barbosa, J., Diercks, H., Knoechel, A., Sen Gupta, R. and Toedter, K.: (A new method for the rapid determination of radioactive strontium isotopes in environmental samples). *Fortschr. Strahlenschutz*, FS-93-67-T (1993) 361-366; C.A., 123 (1995) 245593g.
- 4959 Gaur, S.: Determination of Cs-137 in environmental water by ion-exchange chromatography. *J. Chromatogr. A*, 733 (1996) 57-71 - a review with 113 refs.
- 4960 Lassmann, M., Haenscheid, H., Alt, P. and Boerner, W.: (Chromatography plant in Wuerzburg for the decontamination of sewage containing ^{131}I). *Fortschr. Strahlenschutz*, FS-94-71-T (1994) 723-728; C.A., 123 (1995) 352822c.
- 4961 Nakanishi, T., Higuchi, N., Nomura, M., Aida, M. and Fujii, Y.: Enrichment of ^{232}U by U(IV)-U(VI) redox ion exchange chromatography. *J. Nucl. Sci. Technol.*, 33 (1996) 341-345; C.A., 124 (1996) 354641n.
- 4962 Teffera, Y., Kusmierz, J.J. and Abramson, F.P.: Continuous-flow isotope ratio mass spectrometry using the chemical reaction interface with either gas or liquid chromatographic introduction. *Anal. Chem.*, 68 (1996) 1888-1894.

For additional information see C.A.:
124 (1996) 305926a, 330949t.

See also 4104, 4113, 4166, 4876, 4893, 4894, 4906.