

## Gas Chromatography

### 1. REVIEWS AND BOOKS

- 715 Grob, R.L. (Editor): *Modern Practise of Gas Chromatography* (3rd ed.), John Wiley, New York, 1995, 888 p.  
 716 Adlard, E.R. (Editor): *Chromatography in the Petroleum Industry*. In: *J. Chromatogr. Libr.*, Vol. 56, Elsevier, Amsterdam, 1995, pp. 452.

See also 742, 803, 888, 890, 913, 952, 986, 1020, 1042.

### 2. FUNDAMENTALS, THEORY AND GENERAL

#### 2a. General

- 717 Berezkin, V.G.: (To the definition of chromatography). *Zh. Anal. Khim.*, 50 (1995) 677-678.  
 718 Economou, A., Fielden, P.R. and Packhan, A.I.: Deconvolution of overlapping chromatographic peaks by means of fast Fourier and Hartley transformation. *Analyst (Cambridge)*, 121 (1996) 97-104.  
 719 McGuffin, V.L. and Wu, P.: Three-dimensional molecular simulation of chromatographic separations. *J. Chromatogr. A*, 722 (1996) 3-17.  
 720 Slonecker, P.J., Li, X., Ridgway, T.H. and Dorsey, J.G.: Informational orthogonality of two-dimensional chromatographic separations. *Anal. Chem.*, 68 (1996) 682-689.  
 721 Wu, N., Su, H. and Shi, W.: (Comparison of Grobler-Balisz method with Ambrus method for the determination of dead time in gas chromatography). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 45-46.

#### 2b. Thermodynamics and theoretical relationships

- 722 Blumberg, L.M.: Letter to the editors. *Chromatographia*, 42 (1996) 112-113.  
 723 Bruno, T.J.: Simple and efficient methane-marker devices for chromatographic samples. *J. Chromatogr. A*, 721 (1996) 157-164.  
 724 Davankov, V.A.: Letter to the editors. *Chromatographia*, 42 (1996) 111.  
 725 Quintanilla-López, J.E., Lebrón-Aguilar, R., Tello, A.M. and García-Domínguez, J.A.: Measuring specific retention volumes in capillary gas chromatography with improved accuracy and precision. *J. Chromatogr. A*, 721 (1996) 147-155.  
 726 Voelkel, A. and Fall, J.: Influence of prediction method of the second virial coefficient on inverse gas chromatographic parameters. *J. Chromatogr. A*, 721 (1996) 139-145.

See also 794, 821, 823.

#### 2c. Relationship between structure and chromatographic behaviour

- 727 Berezkin, V.G., Garasimenko, V.A. and Nabivach, V.M.: (Use of chromatographic retention indexes of compounds measured at various temperatures and in different laboratories). *Zavod. Lab.*, 61, No. 5 (1995) 14-17.  
 728 Righezza, M., Hassani, A., Meklati, B.Y. and Chrétien, J.R.: Quantitative structure-retention relationships (QSRR) of congeneric aromatics series studied on phenyl OV phases in gas chromatography. *J. Chromatogr. A*, 723 (1996) 77-91.  
 729 Zenkevich, I.G. and Chupalov, A.A.: (Coding of homologous series of organic compounds for the solution of analytical problems of their group identification). *Vestn. S.-Peterb. Univ., Ser. 4: Fiz., Khim.*, No. 4 (1994) 45-53; *C.A.*, 123 (1995) 305681w.

See also 796, 833, 838, 882, 958.

#### 2d. Measurement of physico-chemical and related values

- 730 Bagane, M. and Gannouni, A.: (Study of water vapor adsorption at high temperature on activated alumina). *Ann. Chim. (Paris)*, 20, No. 2 (1995) 72-80; *C.A.*, 123 (1995) 322721b.  
 731 Chehimi, M., Lascelles, S. and Armes, P.: Characterization of surface thermodynamic properties of *p*-toluene sulfonate-doped polypyrrole by inverse gas chromatography. *Chromatographia*, 41 (1995) 671-677.  
 732 Cordeiro, N., Neto, C.P., Gandini, A. and Belgacem, M.N.: Characterization of the cork surface by inverse gas chromatography. *J. Colloid Interface Sci.*, 174 (1995) 246-249; *C.A.*, 123 (1995) 297798x.  
 733 Hadjar, H., Balard, H. and Papirer, E.: An inverse gas chromatography study of crystalline and amorphous silicas. *Colloids Surf. A*, 99 (1995) 45-51; *C.A.*, 123 (1995) 297392k.  
 734 Huang, X., Yang, S. and He, C.: (Gas chromatographic study of solvent effect of vinyl acetate in asymmetric hydroformylation). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 5-8.  
 735 Ramachandran, B.R., Allen, J.M. and Halpern, A.M.: The importance of weighted regression analysis in the determination of Henry's law constants by static headspace gas chromatography. *Anal. Chem.*, 68 (1996) 281-286.  
 736 Sundaram, A. and Sundaram, K.M.S.: A gas-liquid chromatographic method to determine size spectra of droplets of an aerially applied nonvolatile spray mix deposited on Kromekote cards. *Pestic. Sci.*, 45 (1995) 263-267; *C.A.*, 123 (1995) 332608j.

See also 812, 874, 883, 1063.

## 3. GENERAL TECHNIQUES

## 3a. Apparatus and accessories

- 737 Ami, M., Senda, N., Nakada, T. and Shizukuishi, K.: (Gas chromatograph with automatic column selection mechanism). *Jpn. Kokai Tokkyo Koho* JP 07,229,886 [95,229,886] (Cl. G01N30/38), 29 Aug. 1995, Appl. 94/19,129, 16 Feb. 1994; 3 pp.; C.A., 123 (1995) 357955h.
- 738 Borgerd, A.J. and Wilkerson, C.W., Jr.: Cryogenically cooled microloop system for sampling and injection in fast GC. *Anal. Chem.*, 68 (1996) 701-707.
- 739 Dvorak, B., Martinkova, P. and Rotport, J.: (Apparatus using pulsed chromatographic technique for measuring chemisorption). *Czech Rep.* CZ 279,547 (Cl. G01N15/08), 17 May 1995, Appl. 3,745, 18 Dec. 1992; 8 pp.; C.A., 123 (1995) 357944d.
- 740 Grob, K. and Bronz, M.: On-line GC-LC transfer via a hot vaporizing chamber and vaporizing discharge by overflow; increased sensitivity for the determination of mineral oil in foods. *J. Microcolumn Sep.*, 7 (1995) 421-427.
- 741 Henderson, R. and Wikfors, E.: (Improved retention time stability in gas chromatographs by control of barometric pressure effects on gas flow). *Ger. Offen.* DE 4,442,637 (Cl. G01N30/88), 5 Oct. 1995, US Appl. 220,432, 31 Mar. 1994; 17 pp.; C.A., 123 (1995) 358175r.
- 742 Hinshaw, J.V.: Computer-controlled pneumatics. *LC-GC*, 13 (1995) 792-798; C.A., 123 (1995) 357618a - a review with 18 refs.
- 743 Kolb, B., Zwick, G. and Auer, M.: A water trap for static cryo-headspace gas chromatography. *J. High Resolut. Chromatogr.*, 19 (1996) 37-42.
- 744 Kubicek, K.: (Sorption-catalytic unit for physical and chemical study of catalysts and sorbents). *Czech Rep.* CZ 279,650 (Cl. G01N31/10), 17 May 1995, Appl. 992, 26 May 1993; 21 pp.; C.A., 123 (1995) 351605x.
- 745 Luo, Y.Z., Yang, M.J. and Pawliszyn, J.: Membrane extraction combined with a sorbent coated fiber interface for capillary gas chromatography. *J. High Resolut. Chromatogr.*, 18 (1995) 727-732.
- 746 Munari, F., Colombo, P.A., Magni, P., Zilioli, G., Trestianu, S. and Grob, K.: GC instrumentation for on-column injection of large volumes: Automated optimatization of conditions. *J. Microcolumn Sep.*, 7 (1995) 403-409.
- 747 Nekrasov, V.L., Khatskevich, E.A. and Efros, D.M.: (Assembly for supplying samples into gas chromatograph). *Russ. RU* 2,027,180 (Cl. G01N30/16), 20 Jan. 1995, SU Appl. 4,930,887, 23 Apr. 1991; pp. 207; C.A., 123 (1995) 358178u.
- 748 Niessner, R. and Zajc, A.: (Method of quasi-continuous GC/MS analysis for volatile substances adsorbed on particle-type matrices). *Ger. Offen.* DE 4,406,628 (Cl. G01N30/88), 7 Sep. 1995, Appl. 4,406,628, 1 Mar. 1994; 5 pp.; C.A., 123 (1995) 328938z.
- 749 Nishikawa, Y., Miyoshi, S., Shyoji, M. and Braun, G.: Automated optimization of split ratio in capillary gas chromatography. *J. High Resolut. Chromatogr.*, 18 (1995) 753-756.
- 750 Ramalho, S., Hankemeier, T., de Jong, M., Brinkman, U.A.T. and Vreuls, R.J.J.: Large-volume on-column injections for gas chromatography. *J. Microcolumn Sep.*, 7 (1995) 383-394.
- 751 Reston, R.R. and Kolesar, E.S.Jr.: Silicon-micromachined gas chromatography system used to separate and detect ammonia and nitrogen dioxide. Part I: Design, fabrication, and integration of the gas chromatography system. *J. Microelectromech. Syst.*, 3 (1994) 134-146; C.A., 123 (1995) 305268s.
- 752 Shibata, S.: (Process gas chromatograph.) *Jpn. Kokai Tokkyo Koho* JP 07,244,034 [95,244,034] (Cl. G01N30/02), 19 Sep. 1995, Appl. 94/34,395, 4 Mar. 1994; 4 pp.; C.A., 123 (1995) 358188x.
- 753 Van Lieshout, H.P.M., Janssen, H.G. and Cramers, C.A.: Improvements in high-temperature PTV injection for HT-CGC. *Am. Lab. (Shelton)*, 27, No. 12 (1995) 38-44.
- 754 Wenclawiak, B.W., Heemken, O.P., Sterzenbach, D., Schipke, J., Theobald, N. and Weigelt, V.: Device for efficient solvent collection of environmentally relevant compounds in off-line SFE. *Anal. Chem.*, 67 (1995) 4577-4580.
- 755 Yoshihara, T. and Kamoshita, M.: (Gas chromatograph with hydrogen flame ion detector). *Jpn. Kokai Tokkyo Koho* JP 07,218,490 [95,218,490] (Cl. G01N30/68), 18 Aug. 1995, Appl. 94/13,389, 7 Feb. 1994; 6 pp.; C.A., 123 (1995) 357940z.

See also 804, 817, 819, 827, 931, 1016, 1052, 1075.

## 3b. Detectors and detection reagents

- 756 Abdel-Rehim, M., Kamel, M. and Hassan, M.: Effect of ammonia on the response of the electron capture detector (ECD). *J. High Resolut. Chromatogr.*, 18 (1995) 757-759.
- 757 Aue, W.A., Singh, H. and Millier, B.: Phase-shift-free subtraction chromatograms from a dual-channel detector. *J. Chromatogr. A*, 719 (1996) 468-473.
- 758 Berezhina, L.G., Berezhkin, V.G., Viktorova, E.N. and Sorokina, E.Y.: New selective salt-water phases in steam chromatography. *Anal. Sci.*, 11 (1995) 771-776.
- 759 Hirata, Y., Kawaguchi, Y. and Funada, Y.: Refractive index detection using an ultraviolet detector with a capillary flow cell in preparative SFC. *J. Chromatogr. Sci.*, 34 (1996) 58-62.
- 760 Johnson, D., Quimby, B. and Sullivan, J.: An atomic emission detector for gas chromatography. *Am. Lab. (Shelton)*, 27, No. 15 (1995) 13-20.
- 761 Kishi, H., Fujii, T. and Sato, G.: Characterization of a gas chromatographic surface ionization detector based upon hyperthermal positive surface ionization. *J. Chromatogr. A*, 722 (1996) 169-175.
- 762 Kostev, O.N.: (Photoionization detector for gas chromatography (variants).) *Russ. RU* 2,029,302 (Cl. G01N30/70), 20 Feb. 1995, SU Appl. 5,025,069, 31 Jan. 1992; pp. 180; C.A., 123 (1995) 358187w.
- 763 Madabushi, J., Cai, H., Stearns, S. and Wentworth, W.: Pulsed discharge detectors for GC applications. *Am. Lab. (Shelton)*, 27, No. 15 (1995) 21-30.
- 764 Sliwka, I. and Lasa, J.: A simplified model of the ECD. *Fresenius J. Anal. Chem.*, 354 (1996) 392-396.
- 765 Strode, J.T.B. and Taylor, L.T., III.: Optimization of electron-capture detector when using packed-column supercritical fluid chromatography with modified carbon dioxide. *J. Chromatogr. A*, 723 (1996) 361-369.
- 766 Vitz, E. and Chan, H.: LIMSport VII. Semiconductor gas sensors as GC detectors and "breathalyzers". *J. Chem. Educ.*, 72 (1995) 920-925; C.A., 123 (1995) 313028d.

- 767 Wentworth, W.E., Li, Y. and Stearns, S.D.: Pulsed discharge photoionization detector: application to analysis of chloro alkanes/alkenes. *J. High Resolut. Chromatogr.*, 19 (1996) 85-90.

See also 942, 973.

### 3c. Sorbents and columns, packing procedures

- 768 Abe, I., Terada, K. and Nakahara, T.: Thermal treatment for immobilization of chiral polysiloxanes in capillary gas chromatography. *J. High Resolut. Chromatogr.*, 19 (1996) 91-94.
- 769 Baniceru, M., Radu, S. and Patroescu, C.: Preparation and gas chromatographic characterisation of 3-bromo-4-(4-methylbenzyloxy)azobenzene stationary phase. *Chromatographia*, 41 (1995) 697-701.
- 770 Bell, G. and Gentischer, J.: (Capillary separation column for gas chromatography and method for its fabrication). *Ger. Offen. DE 4,410,521* (Cl. G01N30/60), 28 Sep. 1995, Appl. 4,410,521, 25 Mar. 1994; 4 pp.; C.A., 123 (1995) 357957k.
- 771 Betts, T.J.: Relative polarities of nine modified cyclodextrin commercial stationary phases in gas chromatographic capillaries. *J. Chromatogr. A*, 719 (1996) 375-382.
- 772 Braithwaite, A. and Cooper, M.: A study of the surface modification of alumina for GC. *Chromatographia*, 42 (1996) 77-82.
- 773 Cheng, J. and Zhang, R.: (Application and study of gradient loaded column for gas chromatography). *Huadong Yejin Xueyuan Xuebao*, 12 (1995) 392-399; C.A., 123 (1995) 305647q.
- 774 Dai, R., Fu, R. and Zhou, W.: Application of peralkylated  $\beta$ -CDs capillary columns for the GC separation of positional isomers of industrial chemicals. *J. Microcolumn Sep.*, 7 (1995) 455-460.
- 775 Fukunaga, N.: (Capillary GC columns and packed GC columns. How to choose and use the GC columns, a view in the future). *Kuromatogurafi*, 16 (1995) 104-107; C.A., 123 (1995) 322586m.
- 776 Golovnya, R.V., Terenina, M.B. and Ruchkina, E.L.: (Layered capillary columns with crown-ether complexes for gas-liquid chromatography). *Izv. Akad. Nauk, Ser. Khim.*, (1994) 2169-2173; C.A., 123 (1995) 328846t.
- 777 Grob, K. and Vorburger, T.: Testing the polarity and adsorptivity of nondeactivated GC capillary surfaces. *J. High Resolut. Chromatogr.*, 19 (1996) 27-31.
- 778 Kirsh, S.I. and Fomicheva, T.N.: (Sorbent for gas chromatography containing polyethylene glycol as a stationary phase). *Russ. RU 2,032,900* (Cl. G01N30/48), 10 Apr. 1995, SU Appl. 5,003,938, 5 Aug. 1991; pp. 199; C.A., 123 (1995) 358186v.
- 779 LeFebre, D., Gingrich, J.S. and Lansbarkis, J.R.: A novel rigid capillary column. *Am. Lab. (Shelton)*, 27, No. 12 (1995) 13-14.
- 780 Mastrogiacomo, A.R., Pierini, E. and Sampaolo, L.: A comparison of the critical parameters of some adsorbents employed in trapping and thermal desorption of organic pollutants. *Chromatographia*, 41 (1995) 599-604.
- 781 Morikawa, O.M. and Watanabe, C.: (Characteristics of highly inert stainless steel capillary column and its application). *Kuromatogurafi*, 16 (1995) 108-109; C.A., 123 (1995) 322587n.
- 782 Nabivach, V.M.: (Gas-chromatographic properties of organoclays). *Koks Khim.*, No. 11 (1994) 21-26; C.A., 123 (1995) 328824j.
- 783 Nishimura, O.: Application of a thermal desorption cold trap injector to multidimensional GC and GC-MS. *J. High Resolut. Chromatogr.*, 18 (1995) 699-704.
- 784 Poole, S.K., Miller, K.G. and Poole, C.F.: Variation of selectivity among the poly(siloxane) stationary phases for gas chromatography. *J. Microcolumn Sep.*, 7 (1995) 497-504.
- 785 Santiuste Bermejo, J.M.: (Use of Kovats coefficients in gas chromatography and classification of 200 non-McReynolds stationary phases. Part 1). *An. Quim.*, 90 (1994) 247-250; C.A., 123 (1995) 305640g.
- 786 Santiuste Bermejo, J.M.: (Use of Kovats coefficients in gas chromatography and classification of 200 non-McReynolds stationary phases. Part 2). *An. Quim.*, 90 (1994) 315-323; C.A., 123 (1995) 305653p.
- 787 Shen, T.C. and Wang, M.-L.: A new method for the preparation of polymeric porous layer open tubular columns for GC application. *J. Microcolumn Sep.*, 7 (1995) 471-475.
- 788 Shitangkoon, A. and Vigh, G.: Enantiomer separations using chloroacetyl pentyl cyclodextrins as chiral GC stationary phases. *J. Microcolumn Sep.*, 7 (1995) 493-496.
- 789 Tian, W. and Ballantine, D.S., Jr.: Characterization of cyano-functionalized stationary gas chromatographic phases by linear solvation energy relationships. *J. Chromatogr. A*, 718 (1995) 357-369.
- 790 Wasiak, W. and Rykowska, I.: Chemically bonded chelates as selective complexing sorbents for gas chromatography. IV. Silica surfaces modified with Co(II) and Ni(II) complexes. *J. Chromatogr. A*, 723 (1996) 313-324.
- 791 Yang, H., Zhang, Z. and Lu, W.: Preliminary investigation of a ring-packed glass capillary column (RPGC) containing an electric resistance wire. *J. High Resolut. Chromatogr.*, 18 (1995) 725-726.
- 792 Zhang, G., Qi, X., Yang, Z., Zheng, G. and Liu, H.: (The cross-linking of the flexible glass capillary columns modified by non-crystalline silicone film with polar stationary phases XE-60 and PEG-20M). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 27-29.
- 793 Zhang, W., Xu, G., Shi, J., Yang, L., Zhang, Y. and Lu, P.: (Dynamics study of the new two-dimensional packed-capillary column system in gas chromatography). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 22-26.

See also 814, 815, 824, 825, 830, 1028.

### 3d. Quantitative analysis

See 802.

### 3e. Preparative scale chromatography

See 990, 1072.

### 3f. Programmed temperature, pressure, vapors, gradients

- 794 Girard, B.: Retention index calculation using Kováts constant model for linear temperature-programmed gas chromatography. *J. Chromatogr. A*, 721 (1996) 279-288.
- 795 Jain, V. and Phillips, J.B.: High-speed gas chromatography using simultaneous temperature gradients in both time and distance along narrow-bore capillary columns. *J. Chromatogr. Sci.*, 33 (1995) 601-605.

- 796 Snijders, H., Janssen, H.-G. and Cramers, C.: Optimization of temperature-programmed gas chromatographic separations. I. Prediction of retention times and peak widths from retention indices. *J. Chromatogr. A*, 718 (1995) 339-355.

#### 4. SPECIAL TECHNIQUES

##### 4a. Automation

- 797 Hikosaka, M.: (Process gas chromatograph). *Jpn. Kokai Tokkyo Koho* JP 07,253,419 [95,253,419] (Cl. G01N30/02), 3 Oct. 1995, Appl. 94/68,170, 14 Mar. 1994; 7 pp.; C.A., 123 (1995) 344416h.  
 798 Kajio, T.: (Process gas chromatograph). *Jpn. Kokai Tokkyo Koho* JP 07,248,321 [95,248,321] (Cl. G01N30/30), 26 Sep. 1995, Appl. 94/66,530, 11 Mar. 1994; 6 pp.; C.A., 123 (1995) 344417j.  
 799 Oota, H.: (Determination of gas concentration by gas chromatograph). *Jpn. Kokai Tokkyo Koho* JP 07,248,325 [95,248,325] (Cl. G01N30/86), 26 Sep. 1995, Appl. 94/65,481, 10 Mar. 1994; 4 pp.; C.A., 123 (1995) 344718h.

See also 746, 749.

##### 4b. Computerization and modelling

- 800 Hayes, T.L., Kohne, J.W. and Miller, T.L.: The functional testing of chromatographic software as part of computer validation. *LC-GC*, 13 (1995) 960-968.  
 801 Loope, C.E. and Vargo, C.R.: Optimizing gas chromatography methods by computer modeling. *Am. Environ. Lab.*, 7 (1995) 50-53; C.A., 123 (1995) 358076j.

See also 742.

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

- 802 Janák, K., Colmsjö, A. and Östman, C.: Quantitative analysis using gas chromatography with atomic emission detection. *J. Chromatogr. Sci.*, 33 (1995) 611-621.  
 803 Korhammer, S.A. and Bernreuther, A.: Hyphenation of high-performance liquid chromatography (HPLC) and other chromatographic techniques (SFC, GPC, GC, CE) with nuclear magnetic resonance (NMR). *Fresenius J. Anal. Chem.*, 354 (1996) 131-135 - a review with 77 refs.  
 804 Mertens, M.A.A., Janssen, H.-G.M., Cramers, C.A., Genuit, W.J.L., van Velzen, G.J., Dirkzwager, H. and van Binsbergen, H.: Development and evaluation of an interface for coupled capillary supercritical fluid chromatography/magnetic sector mass spectrometry. *J. High Resolut. Chromatogr.*, 19 (1996) 17-22.  
 805 Troost, J.R. and Olavesen, E.Y.: Gas chromatographic/mass spectrometric calibration bias. *Anal. Chem.*, 68 (1996) 708-711.

See also 783, 849, 905, 1014, 1064.

##### 4f. Trace analysis and preseparation techniques

- 806 Brinkman, U.A.T. and Vreuls, R.J.J.: Solid-phase extraction for on-line sample treatment in capillary gas chromatography. *LC-GC Int.*, 8 (1995) 694-698.  
 807 Comes, P., Gonzalez-Flesca, N., Bader, F. and Grimalt, J.O.: Langmuirian behaviour of smelly volatile organic compounds on air sampling with solid adsorbents. *J. Chromatogr. A*, 723 (1996) 293-299.  
 808 Eckard, P.R. and Taylor, L.T.: Trapping capacities of three solid phases for supercritical fluid extraction with pure carbon dioxide. *J. High Resolut. Chromatogr.*, 19 (1996) 117-120.  
 809 Giese, R.W. and Itani, M.S.: Extractive hydrogenation for chemical analyses. *U.S. US 5,445,966* (Cl. 436-159; G01N30/00), 29 Aug. 1995, Appl. 49,278, 20 Apr. 1993; 25 pp.; C.A., 123 (1995) 280308q.  
 810 Helmig, D. and Vierling, L.: Water adsorption capacity of the solid adsorbents Tenax TA, Tenax GR, Carbotrap, Carbotrap C, Carbosieve SIII, and Carboxen 569 and water management techniques for the atmospheric sampling of volatile organic trace gases. *Anal. Chem.*, 67 (1995) 4380-4386.  
 811 Mangani, F. and Cenciarini, R.: Solid phase microextraction using fused silica fibers coated with graphitized carbon black. *Chromatographia*, 41 (1995) 678-684.  
 812 Prado, C., Periago, J.F. and Sepúlveda-Escrivano, A.: Sorbent evaluation for diffusive monitoring of environmental contaminants. *J. Chromatogr. A*, 719 (1996) 87-93.  
 813 Walsh, J.W. and Illingsworth, B.: Thermal desorption and secondary sorbent focusing without cryogenic techniques: an alternative sample preparation and GC capillary inletting system. *Am. Environ. Lab.*, 7 (1995) 12-13; C.A., 123 (1995) 358064d.

See also 780, 941, 1045, 1051.

##### 4g. Enantiomers, separation

- 814 Bicchi, C., D'Amato, A., Manzin, V., Galli, A. and Galli, M.: Cyclodextrin derivatives in GC separation of racemic mixtures of volatiles. Part IX. The influence of the different polysiloxanes as diluting phase for 2,3-di-O-acetyl-6-O-t-butylidimethylsilyl- $\beta$ -cyclodextrin on the separation of some racemates. *J. Microcolumn Sep.*, 7 (1995) 327-336.  
 815 Bradshaw, J.S., Chen, Z., Yi, G., Rossiter, B.E., Malik, A., Pyo, D., Yun, H., Black, D.R., Zimmerman, S.S., Lee, M.L., Tong, W. and D'Souza, V.T.: 6A,6B- $\beta$ -Cyclodextrin-hexasiloxane copolymers: Enantiomeric separations by a  $\beta$ -cyclodextrin-containing rotaxane copolymer. *Anal. Chem.*, 67 (1995) 4437-4439.

See also 768, 788, 790, 829, 852, 915, 948, 1028.

##### 4h. Other special techniques

- 816 Hinshaw, J.V.: GC in the fast lane. *LC-GC*, 13 (1995) 944-949.

See also 736, 738, 758, 1012.

##### 4i. Supercritical fluid chromatography

- 817 Arnold, M. and Kleiböhmer, W.: Large volume injection for packed column and capillary supercritical fluid chromatography. *J. High Resolut. Chromatogr.*, 18 (1995) 721-724.

- 818 De Castro, M.D.L. and Tena, M.T.: Strategies for supercritical fluid extraction of polar and ionic compounds. *TrAC*, 15 (1996) 32-37.
- 819 Levy, J.M.: Where is supercritical fluid extraction going? *Am. Lab. (Shelton)*, 27, No. 11 (1995) 29-30.
- 820 Lim, S. and Rizvi, S.S.H.: Continuous supercritical fluid processing of anhydrous milk fat in a packed column. *J. Food Sci.*, 60 (1995) 889-893; *C.A.*, 123 (1995) 284091m.
- 821 Rice, J.K., Niemeyer, E.D. and Bright, F.V.: Evidence for density-dependent changes in solute molar absorptivities in supercritical CO<sub>2</sub>: Impact on solubility determination practices. *Anal. Chem.*, 67 (1995) 4354-4357.
- 822 Robson, M.M., Raynor, M.W., Bartle, K.D. and Clifford, A.A.: Modifier addition in microcolumn supercritical fluid chromatography. *J. Microcolumn Sep.*, 7 (1995) 375-381.
- 823 Roth, M.: Thermodynamic background of selectivity shifts in temperature-programmed, constant-density supercritical fluid chromatography. *J. Chromatogr. A*, 718 (1995) 147-152.
- 824 Shen, Y. and Lee, M.L.: Polymethylhydrosiloxane surface deactivation of silica particles for packed capillary column supercritical fluid chromatography. *Chromatographia*, 41 (1995) 665-670.
- 825 Shen, Y., Li, W., Malik, A., Reese, S.L., Rossiter, B.E. and Lee, M.L.: Cyanobiphenyl-substituted polymethylsiloxane encapsulated particles for packed capillary column supercritical fluid chromatography. *J. Microcolumn Sep.*, 7 (1995) 411-419.
- 826 Smith, R.M.: Supercritical fluid extraction of natural products. *LC-GC Int.*, 9 (1996) 8-15.
- 827 Takeuchi, M.: (A mixer for supercritical fluid chromatograph). *Jpn. Kokai Tokkyo Koho* JP 07,159,388 [95,159,388] (Cl. G01N30/02), 23 Jun. 1995, Appl. 93/302,596, 2 Dec. 1993; 4 pp.; *C.A.*, 123 (1995) 305585t.
- 828 Takeuchi, M. and Saito, T.: Two-stage resolution of mixtures by supercritical fluid chromatography. *J. Chromatogr. A*, 722 (1996) 317-332.

See also 754, 759, 765, 803, 804, 808, 834, 837, 845, 862, 870, 875, 890, 934, 954, 967, 973, 997, 1009, 1022, 1033, 1048.

## 5. HYDROCARBONS AND HALOGEN DERIVATIVES

### 5a. Aliphatic hydrocarbons

- 829 Asuncion, L.A. and Baldwin, J.E.: Quantitative analyses of the four isomers of 3,4-diphenylcyclopentene by chiral gas chromatography. *J. Org. Chem.*, 60 (1995) 5778-5784; *C.A.*, 123 (1995) 358135c.
- 830 Ji, Z. and Chang, I.L.: A new look at light hydrocarbon separations on commercial alumina PLOT columns: column selectivity and separation. *J. High Resolut. Chromatogr.*, 19 (1996) 32-36.
- 831 Li, F., Zhao, T. and Ji, D.: (Selection of integral mode in the analysis of *n*-paraffin, *iso*-paraffin and carbon number distributions of paraffin wax by gas chromatography). *Fenxi Huaxue*, 23 (1995) 1208-1210; *C.A.*, 123 (1995) 290295x.

- 832 Nassar, M.I., Abu-Douh, A. and El-Khrisy, E.A.M.: Gas liquid chromatographic study of *Sonchus oleraceus* and *Cassia italica*. *Bull. Natl. Res. Cent. (Egypt)*, 20 (1995) 87-92; *C.A.*, 123 (1995) 310292z.
- 833 Orav, A. and Kailas, T.: The correlation equations describing retention index data on OV-101, OV-275 and PEG 20M. *n*-alkanes and *n*-alkynes. *Chromatographia*, 41 (1995) 726-727.
- See also 790.
- 5b. Cyclic hydrocarbons, fullerenes
- 834 Ashraf-Khorassani, M., Combs, M.T. and Taylor, L.T.: Effect of moisture on supercritical fluid extraction of polynuclear aromatic hydrocarbons and phenols from soil using an automated extractor. *J. High Resolut. Chromatogr.*, 18 (1995) 709-712.
- 835 Barshick, S.-A., Smith, S.M., Buchanan, M.V. and Guerin, M.R.: Determination of benzene content in food using a novel blender purge and trap GC/MS method. *J. Food Compos. Anal.*, 8 (1995) 244-257; *C.A.*, 123 (1995) 337696w.
- 836 Domínguez, A., Alvarez, R., Blanco, C.G. and Díez, M.A.: Chromatographic evaluation of some selected polycyclic aromatic hydrocarbons of coal tars produced under different coking conditions and pitches derived from them. *J. Chromatogr. A*, 719 (1996) 181-194.
- 837 Gao, L., Cui, Z., Zhang, C. and Wang, S.: (Study of the collecting methods in supercritical fluid extraction for polycyclic aromatic hydrocarbons from the synthetic environmental samples). *Sepur (Chin. J. Chromatogr.)*, 14 (1996) 1-4.
- 838 Heinzen, V.E.F. and Yunes, R.A.: Using topological indices in the prediction of gas chromatographic retention indices of linear alkylbenzene isomers. *J. Chromatogr. A*, 719 (1996) 462-467.
- 839 Periago, J.F., Prado, C. and Luna, A.: Purge-and-trap method for the determination of styrene in urine. *J. Chromatogr. A*, 719 (1996) 53-58.
- 840 Riedel, K., Ruppert, T., Conze, C., Scherer, G. and Adlikofner, F.: Determination of benzene and alkylated benzenes in ambient and exhaled air by microwave desorption coupled with gas chromatography-mass spectrometry. *J. Chromatogr. A*, 719 (1996) 383-389.
- 841 Soltyś, E., Jagiełska, E., Solik-Dabrowska, M. and Wojcik, W.: (Gas-chromatographic determination of durene, isodurene, and other aromatic hydrocarbons in products of catalytic methanol conversion). *Przem. Chem.*, 74 (1995) 221-222; *C.A.*, 123 (1995) 328888h.
- 842 Voznáková, Z., Popl, M. and Knapová, M.: Determination of polyaromatic hydrocarbons in the gas phase of air. *Collect. Czech. Chem. Commun.*, 60 (1995) 1115-1123.
- 843 Vu-Duc, T., Huynh, C.-K. and Boiteux, P.: Performance of a chromatographic procedure used in the certification of reference material for polycyclic aromatic hydrocarbons in sewage sludge. *Mikrochim. Acta*, 120 (1995) 271-280.
- 844 Yin, F.: (Rapid determination of the macro and trace amounts of aromatics in synthetic ethylbenzene by chromatography on liquid crystal packing). *Shiyou Huagong Gaodeng Xuexiao Xuebao*, 8 (1995) 28-32; *C.A.*, 123 (1995) 305686b.

See also 727, 754, 850.

## 5c. Halogen derivatives

- 845 Ashraf-Khorassani, M. and Taylor, L.T.: Comparison of modifier addition to the matrix versus modifier addition to the fluid in the supercritical fluid extraction of PCBs from river sediment. *Am. Lab. (Shelton)*, 27, No. 18 (1995) 23-28.
- 846 Benicka, E., Novakovsky, R., Hrouzek, J., Krupcik, J., Sandra, P. and de Zeeuw, J.: Multidimensional gas chromatographic separation of selected PCB atropisomers in technical formulations and sediments. *J. High Resolut. Chromatogr.*, 19 (1996) 95-98.
- 847 Bingkun, Z., Xiaobin, S., Lihui, Q. and Fengming, W.: (Gas chromatographic analysis of tetrachloroethylene in hair sprays). *Huaxue Tongbao*, No. 9 (1995) 37-38; C.A., 123 (1995) 321666a.
- 848 Bruno, T.J. and Wertz, K.H.: Retention of halocarbons on a hexafluoropropylene-epoxide modified graphitized carbon black. Part 5: Heavier ethane- and ethene-based compounds. *J. Chromatogr. A*, 723 (1996) 325-335.
- 849 Bush, B. and Barnard, E.L.: Gas phase infrared spectra of 209 polychlorinated biphenyl congeners using gas chromatography with Fourier transform infrared detection: internal standardization with a  $^{13}\text{C}$ -labeled congener. *Arch. Environ. Contam. Toxicol.*, 29 (1995) 322-326; C.A., 123 (1995) 305665u.
- 850 Fernández, I., Dachs, J. and Bayona, J.M.: Application of experimental design approach to the optimization of supercritical fluid extraction of polychlorinated biphenyls and polycyclic aromatic hydrocarbons. *J. Chromatogr. A*, 719 (1996) 77-85.
- 851 Folch, I., Vaquero, M.T., Comellas, L. and Broto-Puig, F.: Extraction and clean-up methods for improvement of the chromatographic determination of polychlorinated biphenyls in sewage sludge-amended soils: elimination of lipids and sulphur. *J. Chromatogr. A*, 719 (1996) 121-130.
- 852 Glausch, A., Blanch, G.P. and Schurig, V.: Enantioselective analysis of chiral polychlorinated biphenyls in sediment samples by multidimensional gas chromatography-electron-capture detection after steam distillation-solvent extraction and sulfur removal. *J. Chromatogr. A*, 723 (1996) 399-404.
- 853 Golba, W. and Ceckiewicz, S.: (Polychlorinated biphenyls (PCBs) in hydrocarbon oils. Problems concerning extraction and chromatographic analysis). *Chem. Inz. Ekol.*, 2 (1995) 205-209; C.A., 123 (1995) 318301x.
- 854 Grimwall, E., Östman, C. and Nilsson, U.: Determination of polychlorinated biphenyls in human blood plasma by on-line and off-line liquid chromatography-gas chromatography. *J. High Resolut. Chromatogr.*, 18 (1995) 685-691.
- 855 Natzeck, C., Vetter, W., Luckas, B., Moskopp, G. and Buijten, J.: Quantitative determination of toxic mono- and non-ortho polychlorinated biphenyls in cod liver oil after selective liquid chromatographic separation. *Chromatographia*, 41 (1995) 585-593.
- 856 Nerin, C., Martinez, M., Pons, B. and Zufiaurre, R.: Gas-chromatographic determination of chlorobenzenes and HCHs in an urban atmosphere. *Fresenius J. Anal. Chem.*, 354 (1996) 61-65.
- 857 Pedersen-Bjergaard, S., Semb, S.I., Brevik, E.M. and Greibrokk, T.: Capillary gas chromatography combined with atomic emission detection for the analysis of polychlorinated biphenyls. *J. Chromatogr. A*, 723 (1996) 337-347.

858 Raverdino, V., Holzer, R. and Berset, B.J.: Comparison of high resolution gas chromatography with electron impact and negative ion mass spectrometry detection for the determination of coplanar polychlorobiphenyl congeners in sewage sludges. *Fresenius J. Anal. Chem.*, 354 (1996) 477-482.

859 Suzuki, S.: Simultaneous determination of halogenated volatile organic compounds in air by thermal desorption and cold trap GC/MS. *Anal. Sci.*, 11 (1995) 953-960.

860 Ustinova, N.M.: (Gas-chromatographic determination of dichloroethane in ethylene glycol, aqueous glycol solution and water). *Zavod. Lab.*, 61, No. 6 (1995) 14; C.A., 123 (1995) 328896j.

861 Yang, Y. and Baumann, W.: Study of polychlorinated biphenyls in street dust by supercritical fluid extraction-gas chromatography/mass spectrometry. *Fresenius J. Anal. Chem.*, 354 (1996) 56-60.

862 Yang, Y., Bøwadt, S., Hawthorne, B. and Miller, D.J.: Subcritical water extraction of polychlorinated biphenyls from soil and sediment. *Anal. Chem.*, 67 (1995) 4571-4576.

See also 802.

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

863 Heath, D., Moffatt, B., Lowry, R. and Rowland, S.: Quantification of the  $\text{C}^{32+}$  fraction of North Sea gas condensates by high temperature capillary gas chromatography. *Anal. Proceedings*, 32 (1995) 485-487.

864 Langenfeld, J.J., Hawthorne, S.B. and Miller, D.J.: Quantitative analysis of fuel-related hydrocarbons in surface water and wastewater samples by solid-phase microextraction. *Anal. Chem.*, 68 (1996) 144-155.

865 Ludwid, F.J., Sr.: Gas chromatography of petroleum-derived waxes and high-molecular-mass linear alcohols and acids. *J. Chromatogr. A*, 718 (1995) 119-129.

866 Remmler, M., Kopinke, F.-D. and Stottmeister, U.: Thermoanalytical methods for characterizing hydrocarbon-sludge-soil mixtures. *Thermochim. Acta*, 263 (1995) 101-112; C.A., 123 (1995) 349338u.

867 Squicciarini, M.P.: Paraffin, olefin, naphthene, and aromatic determination of gasoline and JP-4 jet fuel with supercritical fluid chromatography. *J. Chromatogr. Sci.*, 34 (1996) 7-12.

868 Subramanian, M., Deo, M.D. and Hanson, F.V.: Compositional analysis of bitumen and bitumen-derived products. *J. Chromatogr. Sci.*, 34 (1996) 20-26.

See also 1061, 1062, 1068, 1070.

## 6. ALCOHOLS

869 Viktorova, E.N. and Berezkina, L.G.: Retention of alcohols in steam chromatography using  $\text{CaCl}_2\text{-H}_2\text{O}$  salt as stationary phase. *J. High Resolut. Chromatogr.*, 19 (1996) 59-61.

See also 865.

## 7. PHENOLS

- 870 Ashraf-Khorassani, M., Gidanian, S. and Yamini, Y.: Effect of pressure, temperature, modifier, modifier concentration, and sample matrix on the supercritical fluid extraction efficiency of different phenolic compounds. *J. Chromatogr. Sci.*, 33 (1995) 658-662.
- 871 Li, X.: (Determination of priority phenols in environmental water by gas chromatography). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 37-40.
- 872 Llompart, M.P., Lorenzo, R.A. and Cela, R.: Multivariate optimization of supercritical fluid derivatization and extraction of phenol in soil samples. *J. Chromatogr. Sci.*, 34 (1996) 43-51.
- 873 Llompart, M.P., Lorenzo, R.A. and Cela, R.: Optimization of supercritical fluid extraction of phenol and cresols in soil samples. *J. Chromatogr. A*, 723 (1996) 123-134.
- 874 Mahmoud, M.E.: Studies of hydrogen/deuterium exchange of monodeuteriophenol in fused-silica capillary columns using gas chromatography-mass spectrometry. *J. Chromatogr. A*, 719 (1996) 474-478.
- 875 Meyer, A. and Kleiböhmer, W.: Determination of pentachlorophenol in leather using supercritical fluid extraction with *in situ* derivatization. *J. Chromatogr. A*, 718 (1995) 131-139.
- 876 Rodríguez, I., Turnes, M.I., Mejuto, M.C. and Cela, R.: Determination of chlorophenols at the sub-ppb level in tap water using derivatization, solid-phase extraction and gas chromatography with plasma atomic emission detection. *J. Chromatogr. A*, 721 (1996) 297-304.

See also 834, 907.

## 8. SUBSTANCES CONTAINING HETEROCYCLIC OXYGEN

## 8a. Flavonoids

- 877 Gawdzik, J., Kawka, S., Mardarowicz, M., Suprynowicz, Z. and Wolski, T.: Supercritical fluid extraction of furanocoumarins from the fruits of *Archangelica offic. Hoffm.* *J. High Resolut. Chromatogr.*, 18 (1995) 781-783.
- 878 Mazur, W., Fotsis, T., Wahala, K., Ojala, S., Salakka, A. and Adlercreutz, A.: Isotope dilution gas chromatographic-mass spectrometric method for the determination of isoflavonoids, coumestrol and lignans in food samples. *Anal. Biochem.*, 233 (1996) 169-180.
- 879 Übler, E., Kern, F. and Bestmann, H.J.: Trail pheromone of two formicine ants, *Camponotus silvicola* and *C. rufipes* (Hymenoptera: formicidae). *Naturwissenschaften*, 82 (1995) 523-525.

See also 748, 907.

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

- 880 Ferrario, J., Byrne, C., McDaniel, D. and Dupuy, A.Jr.: Determination of 2,3,7,8-chlorine-substituted dibenz-p-dioxins and -furans at the part per trillion level in United States beef fat using high-resolution gas chromatography/high resolution mass spectrometry. *Anal. Chem.*, 68 (1996) 647-652.

- 881 Harms, M., Lorenz, W. and Bahadir, M.: (Rapid determination of polyhalogenated dioxins and furans at fire residues). *G/T Fachz. Lab.*, 39 (1995) 724-729; *C.A.*, 123 (1995) 321300b.

## 9. OXO COMPOUNDS, ETHERS, EPOXIDES AND QUINONES

- 882 Boneva, S. and Balbolov, E.: Capillary gas chromatography of aromatic bicyclic and tricyclic spiro ketones. *Chromatographia*, 41 (1995) 594-598.
- 883 Koutek, B., Hoskovec, M., Vrkocová, P., Konecny, K., Feltl, L. and Vrkoc, J.: Gas chromatographic determination of vapour pressures of pheromone-like compounds III. Aldehydes. *J. Chromatogr. A*, 719 (1996) 391-400.
- 884 Mao, L., Lian, H., Dai, J. and Miao, J.: (Gas chromatographic determination of trace epichlorohydrin residue in tris(2,3-epoxy propyl)isocyanurate). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 66.
- 885 Molnár-Perl, I., Tisza, S., Korös, E., Kurin-Csörgei, K. and Szalai, I.: GC/MS Quantification of hydroquinone, 1,4-benzoquinone, and 1,4-cyclohexanedione: one by one and simultaneously. *J. High Resolut. Chromatogr.*, 18 (1995) 749-752.
- 886 Villanueva, J. and Grimalt, J.O.: Pitfalls in the chromatographic determination of the alkenone  $U_3\gamma$  index for paleotemperature estimation. *J. Chromatogr. A*, 723 (1996) 285-291.
- 887 Xie, P.: (Analysis of industrial furancarboxaldehyde by GC with wide-bore capillary column). *Fenxi Ceshi Xuebao*, 14, No. 3 (1995) 54-57; *C.A.*, 123 (1995) 328912m.

## 10. CARBOHYDRATES

## 10a. Mono and oligosaccharides. Structural studies

- 888 Black, G.E. and Fox, A.: Recent progress in the analysis of sugar monomers from complex matrices using chromatography in conjunction with mass spectrometry or stand-alone tandem mass spectrometry. *J. Chromatogr. A*, 720 (1996) 51-60 - a review with 38 refs.
- 889 Bleton, J., Mejanelle, P., Sansoulet, J., Goursaud, S. and Tchapla, A.: Characterization of neutral sugars and uronic acids after methanolysis and trimethylsilylation for recognition of plant gums. *J. Chromatogr. A*, 720 (1996) 27-49 - a review with 32 refs.
- 890 Lafosse, M., Herbreteau, B. and Morin-Allory, L.: Supercritical fluid chromatography of carbohydrates. *J. Chromatogr. A*, 720 (1996) 61-73 - a review with 42 refs.
- 891 Marga, F., Freyssac, V. and Morvan, H.: Rapid gas liquid chromatography microanalysis of carbohydrates in woody plant tissues. *J. Trace Microprobe Tech.*, 13 (1995) 473-478; *C.A.*, 123 (1995) 334043v.
- 892 Relva, A.M.S., Chaves das Neves, H.J. and Ferreira, M.A.: Determination of lactulose and mannitol in urine by HRGC. *J. High Resolut. Chromatogr.*, 18 (1995) 692-694.
- 893 Tisza, S., Molnár-Perl, I., Friedman, M. and Sass, P.: Simultaneous capillary GC of acids and sugars as their silyl(oxime) derivatives: quantitation of chlorogenic acid, raffinose, and pectin substances. *J. High Resolut. Chromatogr.*, 19 (1996) 54-58.

- 894 Veness, R.G. and Evans, C.S.: Identification of monosaccharides and related compounds by gas chromatography-Fourier transform infrared spectroscopy of their trimethylsilyl ethers. *J. Chromatogr. A*, 721 (1996) 165-172.
- 10b. *Polysaccharides, mucopolysaccharides, lipopolysaccharides*
- 895 Pena, A., Capella, S. and González, C.: Characterization and identification of the mucilage extracted from orchid bulbs (*Bletia campanulata*) by high temperature capillary gas chromatography (HT-CGC). *J. High Resolut. Chromatogr.*, 18 (1995) 713-717.
- 10c. *Glycoproteins and their constituents*
- 896 Wang, P., Murugaiah, V., Yeung, B., Vouros, P. and Giese, R.W.: 2-Phosphoglycolate and glycolate-electrophore detection, including detection of 87 zeptomoles of the latter by gas chromatography-electron-capture mass spectrometry. *J. Chromatogr. A*, 721 (1996) 289-296.
11. ORGANIC ACIDS AND LIPIDS
- 11a. *Organic acids and simple esters*
- 897 Brinkman, J.H.W., van Dijk, A.G., Wagenaar, R. and Quirijns, J.K.: Determination of daminozide residues in apples using gas chromatography with nitrogen-phosphorus detection. *J. Chromatogr. A*, 723 (1996) 355-360.
- 898 De Swaeef, S.I. and Vlietinck, A.J.: Simultaneous quantitation of lauric acid and ethyl laurate in *Sabal serrulata* by capillary gas chromatography and derivatisation with trimethyl sulphonium-hydroxide. *J. Chromatogr. A*, 719 (1996) 479-482.
- 899 Dobson, G., Christie, W.W. and Sebedio, J.L.: Gas chromatographic properties of cyclic dienoic fatty acids formed in heated linseed oil. *J. Chromatogr. A*, 723 (1996) 349-354.
- 900 Gasparoli, A. and Giovanessi, L.: (Analytical method for determination of castor oil fatty acid composition). *Riv. Ital. Sostanze Grasse*, 72 (1995) 207-209; *C.A.*, 123 (1995) 283853z.
- 901 Guil, J.L., Torija, M.E., Giménez, J.J. and Rodríguez, I.: Identification of fatty acids in edible wild plants by gas chromatography. *J. Chromatogr. A*, 719 (1996) 229-235.
- 902 Li, J., Tian, X. and Li, B.: Gas chromatographic analysis of succinic anhydride in catalytic hydrogenation of maleic anhydride. *Sepu (Chin. J. Chromatogr.)*, 13 (1995) 481-482.
- 903 Mingrone, G., Greco, A.V., Capristo, E., Benedetti, G., Castagneto, M. and Gasbarrini, G.: An improved GLC method for a rapid, simultaneous analysis of both medium chain fatty acids and medium chain triglycerides in plasma. *Clin. Chim. Acta*, 240 (1995) 195-207.
- 904 Mo, G., Zhang, X., Lu, Y. and Qin, Z.: (Determination of brain-tissue free fatty acids by flash methylation gas-liquid chromatography). *Shanghai Yike Daxue Xuebao*, 22 (1995) 200-202; *C.A.*, 123 (1995) 334027t.
- 905 Mossoba, M.M., Yurawecz, M.P., Lin, H.S., McDonald, R.E., Flickinger, B.D. and Perkins, E.G.: Application of GC-MI-FTIR spectroscopy to the structural elucidation of cyclic fatty acid monomers. *Am. Lab. (Shelton)*, 27, No. 14 (1995) 16K-16O.
- 906 Ondarza, M.A. and Sotelo, F.: Neutral glycolipids in adult rabbit blood and analysis of their function as specific receptors for micro-organisms. *Biomed. Chromatogr.*, 10 (1996) 6-10.
- 907 Packert, M. and Steinhart, H.: Separation and identification of some monomeric and dimeric phenolic acids by a simple gas chromatographic method using a capillary column and FID-MSD. *J. Chromatogr. Sci.*, 33 (1995) 631-639.
- 908 Pan, F., Zhu, J., Luo, Y. and Sun, H.: (Determination of  $\alpha$ -acetyl- $\gamma$ -butyrolactone by gas chromatography). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 69-70.
- 909 Pan, L., Adams, M. and Pawliszyn, J.: Determination of fatty acids using solid-phase microextraction. *Anal. Chem.*, 67 (1995) 4396-4403.
- 910 Pérez-Camino, M.C., Moreda, W. and Cert, A.: Determination of diacylglycerol isomers in vegetable oils by solid-phase extraction followed by gas chromatography on a polar phase. *J. Chromatogr. A*, 721 (1996) 305-314.
- 911 Poluyaktova, S.K., Golberg, N.D. and Feldkoren, B.I.: (A micromethod for estimation of tissue lipase activity using gas-liquid chromatography). *Vopr. Med. Khim.*, 41, No. 1 (1995) 57-59; *C.A.*, 123 (1995) 279353u.
- 912 Rader, J.L., Angyal, G., O'Dell, R.G., Weaver, C.M., Sheppard, A.J. and Bueno, M.P.: Determination of total fat and saturated fat in foods by packed column gas-liquid chromatography after acid hydrolysis. *Food Chem.*, 54 (1995) 419-427; *C.A.*, 123 (1995) 312420p.
- 913 Shibamoto, T. (Editor): *Lipid Chromatographic Analysis*. Marcel Dekker, New York, 1995, 424 p.
- 914 Sinkkonen, S., Kolehmainen, E., Paasivirta, J., Hämäläinen, S. and Lahtiperä, M.: Analysis of chlorinated acetic and propionic acids as their pentafluorobenzyl derivatives. I. Preparation of the derivatives. *J. Chromatogr. A*, 718 (1995) 391-396.
- 915 Stritzel, R., Dobner, B., Bringezu, F. and Nuhn, P.: Separation of racemic 2-alkyl-branched fatty acid methyl esters by gas chromatography on a commercially available chiral phase. *J. High Resolut. Chromatogr.*, 19 (1996) 121-123.
- 916 Wolff, R.L. and Bayard, C.C.: Improvement in the resolution of individual *trans*-18:1 isomers by capillary gas-liquid chromatography: use of a 100-m CP-Sil 88 column. *J. Am. Oil Chem. Soc.*, 72 (1995) 1197-1201.
- 917 Ye, F., Wang, J., Gong, B., Ge, W. and Feng, Z.: (Gas chromatographic analysis of fat and oil from *Myocastor coypus*). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 56-57.
- 918 Zhang, M., Hu, M., Tang, M., Zhou, G. and Zhang, W.: Determination of fatty acids in the phospholipid of rat biological membrane by capillary gas chromatography (CGC). *Sepu (Chin. J. Chromatogr.)*, 13 (1995) 415-417.
- 919 Zhang, Q.: (The extraction and analysis of scallop fat). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 30-32.
- 920 Zheng, W., Tan, B., Tang, L. and Li, Z.: (Determination of fatty acids in nematode by gas chromatography). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 53-55.

See also 820, 832, 865, 889, 1026.

**11c. Lipids and their constituents**

- 921 Ozada, L., de la Fuente, M.A., Fontech, J. and Juárez, M.: Considerations of the quantitative aspect of the determination of milkfat triglycerides with split PTV and on-column injection. *J. High Resolut. Chromatogr.*, 18 (1995) 771-775.
- 922 Tava, A., Cunico, C., Cremona, R. and Piccinini, E.: Isomeric composition of the ester fraction from epicuticular waxes of *Festuca arundinacea* Schreb. *J. High Resolut. Chromatogr.*, 19 (1996) 43-48.

See also 820, 903, 913, 918, 1059.

**11d. Lipoproteins and their constituents**

See 906.

**12. ORGANIC PEROXIDES**

- 923 Lercker, G., Bortolomeazzi, R., Pizzale, L. and Vichi, S.: Thermal degradation of single 7-cholesteryl acetate hydroperoxide. *Chromatographia*, 42 (1996) 29-33.
- 924 Toschi, T.G., Stante, F., Capella, P. and Lercker, G.: Study on position and geometric configuration of methyl linoleate hydroperoxide isomers obtained by thermo-oxidation: chromatographic analyses of their corresponding hydroxy derivatives. *J. High Resolut. Chromatogr.*, 18 (1995) 764-766.

**13. STEROIDS****13a. General techniques**

- 925 Chandrasekaran, A., Osman, M., Raveendranath, P., Chan, K., Scatina, J.A. and Sisenwine, S.F.: Characterization of metabolites of  $\Delta^{8,9}$ -dehydroestrone in dogs. *J. Mass Spectrom.*, 30 (1995) 1505-1511; C.A., 123 (1995) 306804a.

**13b. Pregnane and androstane derivatives**

- 926 Barbarulo, M.V., Buiarelli, F., Ciardi, M., Giarrusso, A., Rosati, F. and Cartoni, G.P.: Capillary GC-MS investigation of the metabolism and excretion of oxabalone in man. *J. High Resolut. Chromatogr.*, 18 (1995) 705-708.
- 927 Thienpont, L.M., de Brabandere, V., Stöckl, D. and de Leenheer, A.P.: Candidate reference method for determining serum cortisol based on isotope dilution-gas chromatography/mass spectrometry using hexafluorobutyrylation as derivatization method. *Anal. Biochem.*, 234 (1996) 204-209.
- 928 Wolthers, B.G., Kraan, G.P.B., van der Molen, J.C., Nagel, G.T., Rouwe, C.W., Lenting, F. and Boersma, E.P.: Urinary steroid profile of a newborn suffering from pseudohypoaldosteronism. *Clin. Chim. Acta*, 236 (1995) 33-43.

**13c. Estrogens**

- 929 Pommier, F., Sioufi, A. and Godbillon, A.: Simultaneous determination of norethisterone and six metabolites in human plasma by capillary gas chromatography with mass-selective detection. *J. Chromatogr. B*, 674 (1995) 155-165.

**13d. Sterols**

- 930 Ballesteros, E., Gallego, M. and Valcárcel, M.: Gas chromatographic determination of cholesterol and tocopherols in edible oils and fats with automatic removal of interfering triglycerides. *J. Chromatogr. A*, 719 (1996) 221-227.
- 931 Johnson, J.H., McIntyre, P. and Zdunek, J.: Automated sample preparation for cholesterol determination in foods. *J. Chromatogr. A*, 718 (1995) 371-381.

See also 923.

**13e. Bile acids and alcohols**

- 932 Rodrigues, C.M.P. and Setchell, K.D.R.: Performance characteristics of reversed-phase bonded silica cartridges for serum bile acid extraction. *Biomed. Chromatogr.*, 10 (1996) 1-5.

**15. TERPENES AND OTHER VOLATILE AROMATIC COMPOUNDS****15a. Terpenes**

- 933 Hiltunen, R. and Laakso, I.: Gas chromatographic analysis and biogenetic relationships of monoterpane enantiomers in Scots pine and juniper needle oils. *Flavour Fragrance J.*, 10 (1995) 203-210; C.A., 123 (1995) 296200j.

See also 814.

**15b. Essential oils**

- 934 Fuh, M.-R.S., Pan, W.H., Hsieh, I.J. and Chuo, C.-M.: Preparative-scale supercritical fluid extraction of essential oils from *Syzygium aromaticum* (clove bud). *Am. Lab. (Shelton)*, 27, No. 18 (1995) 36-41.
- 935 Galletti, G.C., Russo, M.T. and Bocchini, P.: Pyrolysis gas chromatography/mass spectrometry used to simultaneously determine essential oil and phenolic compounds in the monks' pepper *Vitis agnus-castus* L. *Rapid Commun. Mass Spectrom.*, 9 (1995) 1252-1260; C.A., 123 (1995) 296213r.
- 936 Hethelyi, E., Eseko, I., Grosz, M., Mark, G. and Palinkas, J.: (Capillary GC analysis of Artemisia essential oils). *Olaj, Szappan, Kozmet.*, 44 (1995) 117-120; C.A., 123 (1995) 321676d.
- 937 Mangas, J.J., González, M.P., Rodríguez, R. and Blanco, D.: Solid-phase extraction and determination of trace aroma and flavour components in cider by GC-MS. *Chromatographia*, 42 (1996) 101-105.
- 938 Nassir-Ahmadi, A., Rustaiyan, A. and Jassbi, A.R.: (Chemical analysis of essential oil of *Artemisia haussknechtii* Boiss by GC and GC/MS). *J. Sch. Pharm., Med. Sci. Univ. Tehran*, 4, No. 1/2 (1994) 39-49; C.A., 123 (1995) 310348x.

- 939 Nishimura, O.: Identification of the characteristic odorants in fresh rhizomes of ginger (*Zingiber officinale* Roscoe) using aroma extract dilution analysis and modified multidimensional gas chromatography-mass spectroscopy. *J. Agric. Food Chem.*, 43 (1995) 2941-2945.

See also 933.

## 16. NITRO AND NITROSO COMPOUNDS

- 940 Kataoka, H., Shindoh, S. and Makita, M.: Selective determination of volatile N-nitrosamines by derivatization with diethyl chlorothiophosphate and gas chromatography with flame photometric detection. *J. Chromatogr. A*, 723 (1996) 93-99.  
 941 Tomkins, B.A., Griest, W.H. and Higgins, C.E.: Determination of N-nitrosodimethylamine at part-per-trillion levels in drinking waters and contaminated groundwaters. *Anal. Chem.*, 67 (1995) 4387-4395.

See also 999, 1033.

## 17. AMINES, AMIDES AND RELATED NITROGEN COMPOUNDS

### 17a. Amines and polyamines

See 999.

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

- 942 Andersons, A., Simonyan, S. and Shymanska, M.: (Gas-liquid chromatography of some aliphatic and heterocyclic mono- and polyfunctional amines. 35. Relative sensitivity of electron-capture detector to cyclic nitrogen-containing compounds). *Latv. Kim. Z.*, No. 5 (1994) 572-578; *C.A.*, 123 (1995) 305654q.  
 943 Brunmark, P., Dalene, M. and Skarping, G.: Gas chromatography-negative-ion chemical ionization mass spectrometry of hydrolyzed human urine and blood plasma for the biomonitoring of occupational exposure to 4,4-methylenebisaniline. *Analyst (Cambridge)*, 120 (1996) 41-45.  
 944 Hsu, F.-F., Lakshmi, V., Rothman, N., Bhatnager, K., Hayes, R.B., Kashyap, R., Parikh, D.J., Kashyap, S.K., Turk, J., Zenser, T. and Davis, B.: Determination of benzidine, N-acetylbenzidine and N,N-diacetylbenzidine in human urine by capillary gas chromatography/negative ion chemical ionization mass spectrometry. *Anal. Biochem.*, 234 (1996) 183-189.  
 945 Moore, K.A., Soine, W.H. and Poklis, A.:  $\alpha$ -Benzyl-N-methylphenethylamine (BNMPA), an impurity of illicit methamphetamine synthesis: I. Physical characterization and GC-MS analysis of BNMPA and anticipated metabolites in urine. *J. Anal. Toxicol.*, 19 (1995) 542-548; *C.A.*, 123 (1995) 332231f.  
 946 Nakato, Y., Nishimura, T., Hattori, Y. and Takabayashi, Y.: (Study on the determination of toxic chemicals in exhaust gas, I. N-methylaniline, N-ethylaniline, o-anisidine and p-anisidine). *Kankyo Kagaku*, 5 (1995) 605-616; *C.A.*, 123 (1995) 348380q.

- 947 Schoene, K., Bruckert, H.-J., Jürling, H. and Steinhanss, J.: Derivatization of 10-chloro-5,10-dihydrophenarsazine (Adamsite) for gas chromatographic analysis. *J. Chromatogr. A*, 719 (1996) 401-409.

See also 1033.

## 18. AMINO ACIDS AND PEPTIDES; CHEMICAL STRUCTURE OF PROTEINS

### 18a. Amino acids and their derivatives

- 948 Abe, I., Fujimoto, N., Nishiyama, T., Terada, K. and Nakahara, T.: Rapid analysis of amino acid enantiomers by chiral-phase capillary gas chromatography. *J. Chromatogr. A*, 722 (1996) 221-227.  
 949 Kim, K.R., Kim, J.H., Cheong, E.-j. and Jeong, C.-m.: Gas chromatographic amino acid profiling of wine samples for pattern recognition. *J. Chromatogr. A*, 722 (1996) 303-309.  
 950 Matsumura, S., Kataoka, H. and Makita, M.: Capillary gas chromatographic analysis of protein amino acids as their N(O,S)-isobutoxycarbonyl methyl ester derivatives. *Biomed. Chromatogr.*, 9 (1995) 205-210.  
 951 Simpson, J.T., Torok, D.S., Girard, J.E. and Markey, S.P.: Analysis of amino acids in biological fluids by pentafluorobenzyl chloroformate derivatization and detection by electron capture negative ionization mass spectrometry. *Anal. Biochem.*, 234 (1996) 58-68.  
 952 Watanabe, Y. and Sugihara, A.: (Current status of amino acid analysis). *Kagaku to Kogyo (Osaka)*, 69 (1995) 426-433; *C.A.*, 123 (1995) 333928a - a review with 27 refs.

See also 768.

## 19. PROTEINS

### 19f. Structural and muscle proteins

See 911.

## 21. PURINES, PYRIMIDINES, NUCLEIC ACIDS AND THEIR CONSTITUENTS

### 21a. Purines, pyrimidines, nucleosides, nucleotides

- 953 Masuika, T., Kikuchi, K., Saito, A., Hashimoto, T. and Takemoto, Y.: (Determination of 5-fluorouracil incorporated into RNA in tissue using gas chromatography-mass spectrometry). *Kagaku Ryoho no Ryoiki*, 11 (1995) 1456-1461; *C.A.*, 123 (1995) 275043v.  
 954 Qiu, D., Xiao, X. and Li, D.: Determination of caffeine in Chinese tea by supercritical fluid extraction (SFE) and gas chromatography/mass spectrometry. *Sepu (Chin. J. Chromatogr.)*, 13 (1995) 450-452.

- 955 Wagner, J.R., Blount, B.C. and Weinfeld, M.: Excitation of oxidative cytosine modifications from  $\gamma$ -irradiated DNA by *Escherichia coli* endonuclease III and human whole-cell extracts. *Anal. Biochem.*, 233 (1996) 76-86.

21d. Structural studies on RNA and RNA mapping

See 953.

22. ALKALOIDS

- 956 Ley, F.R., Jeffcoat, A.R. and Thomas, B.F.: Determination of ibogaine in plasma by gas chromatography-chemical ionization mass spectrometry. *J. Chromatogr. A*, 723 (1996) 101-109.

See also 954.

23. OTHER SUBSTANCES CONTAINING HETEROCYCLIC NITROGEN

23e. Other N-heterocyclic compounds

- 957 Hu, P., Sun, K., Chen, W. and Zhu, M.: (Analysis of the morphology and distribution of nitrogen-containing compounds in heavy oil-research of on-line coupled high performance liquid chromatography/gas chromatography (HPLC-GC) method). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 10-13.  
 958 Zhuravleva, I.L., Krikunova, N.I. and Golovnya, R.V.: (Sorption characteristics of N-alkylimidazoles under capillary gas chromatographic conditions). *Izv. Akad. Nauk, Ser. Khim.*, No. 2 (1995) 309-313; *C.A.*, 123 (1995) 305642j.

24. ORGANIC SULPHUR COMPOUNDS (INCL. GLUCOSINOLATES)

- 959 Alkhazov, T.G., Kozharov, A.I., Ismailov, Y.A. and Krashennikov, S.V.: (Method for analysis of sulfur-containing gases by gas chromatography). *Russ. RU 2,032,899 (Cl. G01N30/06)*, 10 Apr. 1995, SU Appl. 4,876,154, 13 Aug. 1990; pp. 198-199; *C.A.*, 123 (1995) 358015p.  
 960 Andersson, J.T. and Sielex, K.: Dimethylbenzothiophenes and methyldibenzothiophenes in crude oils from different sources. *J. High Resolut. Chromatogr.*, 19 (1996) 49-53.  
 961 Osipova, O.A., Kirichenko, V.E. and Pashkevich, K.I.: Determination of lower alkylmercaptans by reaction gas-liquid chromatography. *J. Anal. Chem. (Transl. of Zh. Anal. Khim.)*, 50 (1995) 781-784.

25. ORGANIC PHOSPHORUS COMPOUNDS (INCL. SUGAR PHOSPHATES)

- 962 Degenhardt-Langelaan, C.E.A.M. and Kientz, C.E.: Capillary gas chromatographic analysis of nerve agents using large volume injections. *J. Chromatogr. A*, 723 (1996) 210-214.

- 963 Fredriksson, S.-A., Hammerstroem, L.-G., Henriksson, L. and Lakso, H.-A.: Trace determination of alkyl methylphosphonates in environmental and biological samples using gas chromatography/negative-ion chemical ionization mass spectrometry and tandem mass spectrometry. *J. Mass Spectrom.*, 30 (1995) 1133-1143; *C.A.*, 123 (1995) 358137e.

- 964 Goenechea, S. and Raab, U.: Gas-chromatographic determination and quantitation of tricresyl phosphate isomers in blood by nitrogen-phosphorus detection. *Chromatographia*, 41 (1995) 610-611.

- 965 Gu, H., Zhou, L., Cai, G. and Zhong, Y.: (Analysis of organophosphorus warfare agents and their degradation products by gas chromatography-mass spectrometry). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 41-44.

See also 1059.

26. ORGANOMETALLIC AND RELATED COMPOUNDS

26a. Organometallic compounds

- 966 Ceulemans, M. and Adams, F.C.: Evaluation of sample preparation methods for organotin speciation analysis in sediments - focus on monobutyltin extraction. *Anal. Chim. Acta*, 317 (1995) 161-170.

- 967 Cowey, C.M., Bartle, K.D. and Burford, M.D.: Solubility of ferrocene and a nickel complex in supercritical fluids. *J. Chem. Eng. Data*, 40 (1995) 1217-1221.

- 968 Dodd, M., Pergantis, S.A., Cullene, W.R., Li, H., Eigendorf, G.K. and Reimer, K.J.: Antimony speciation in freshwater plant extracts by using hydride generation-gas chromatography-mass spectrometry. *Analyst (Cambridge)*, 121 (1996) 223-228.

- 969 Emteborg, H., Björklund, E., Odman, F., Karlsson, L., Mathiasson, L., Frech, W. and Baxter, D.C.: Determination of methylmercury in sediments using supercritical fluid extraction and gas chromatography coupled with micro-wave-induced plasma atomic emission spectrometry. *Analyst (Cambridge)*, 121 (1996) 19-29.

- 970 Sarradin, P.M., Leguille, F., Astrue, A., Pinel, R. and Astrue, M.: Optimization of atomization parameters in the speciation of organotin compounds by hydride generation-gas chromatography-electrothermal atomic absorption spectrometry. *Analyst (Cambridge)*, 120 (1996) 79-83.

- 971 Xu, F., Jiang, G. and Zhao, J.: (Determination of tetraethyllead in gasoline by gas chromatography with surface emission flame photometric detector). *Fenxi Huaxue*, 23 (1995) 1165-1167; *C.A.*, 123 (1995) 291303k.

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

- 972 De la Calle Guntinas, M.B., Ceulemans, M., Witte, C., Lobinski, R. and Adams, F.C.: Evaluation of a purge-and-trap injection system for capillary gas chromatography-microwave induced plasma-atomic emission spectrometry for the determination of volatile selenium compounds in water. *Mikrochim. Acta*, 120 (1995) 73-82.

- 973 Kumar, U.T., Vela, N.P. and Caruso, J.A.: Multi-element detection of organometals by supercritical fluid chromatography with inductively coupled plasma mass spectrometric detection. *J. Chromatogr. Sci.*, 33 (1995) 606-610.
- 974 Morcillo, Y., Cai, Y. and Bayona, M.J.: Rapid determination of methyltin compounds in aqueous samples using solid phase microextraction and capillary gas chromatography following *in-situ* derivatization with sodium tetraethylborate. *J. High Resolut. Chromatogr.*, 18 (1995) 767-770.
- 975 Quevauviller, P., Chiavarini, S., Cremisini, C., Morabito, R., Bianchi, M. and Muntau, H.: Preparation and homogeneity study of a mussel candidate reference material for certification of organotin compounds. *Mikrochim. Acta*, 120 (1995) 281-287.
- 26c. Coordination compounds  
See 967.
27. VITAMINS AND VARIOUS ANIMAL GROWTH FACTORS (NON-PEPTIDIC)  
See 930.
28. ANTIBIOTICS  
976 Gude, T., Preiss, A. and Rubach, K.: Determination of chloramphenicol in muscle, liver, kidney and urine of pigs by means of immunoaffinity chromatography and gas chromatography with electron-capture detection. *J. Chromatogr. B*, 674 (1995) 197-204.
- 977 Shen, L., Xu, Y., Wu, Y., Wang, S. and Zhang, C.: (Determination of securinine in human body fluid). *Fenxi Huaxue*, 23 (1995) 1193-1196; *C.A.*, 123 (1995) 305881m.
29. INSECTICIDES, PESTICIDES AND OTHER AGROCHEMICALS  
29a. General techniques  
978 Bicchi, C., D'Amato, A. and Binello, A.: Identification of pesticide residues in real matrices by combining retention indices and specific multidetection responses. *J. High Resolut. Chromatogr.*, 19 (1996) 80-84.
- 979 Eisert, R. and Levsen, K.: Determination of pesticides in aqueous samples by solid-phase microextraction in-line coupled to gas chromatography-mass spectrometry. *J. Am. Soc. Mass Spectrom.*, 6 (1995) 1119-1130; *C.A.*, 123 (1995) 321552k.
- 980 Emteborg, H., Baxter, D.C., Sharp, M. and Frech, W.: Evaluation mechanism and application of solid-phase extraction using a dithiocarbamate resin for the sampling and determination of mercury species in humic-rich natural waters. *Analyst (Cambridge)*, 120 (1996) 69-77.
- 981 Redondo, M.J., Ruiz, M.J., Boluda, R. and Font, G.: Optimization of a solid-phase extraction technique for the extraction of pesticides from soil samples. *J. Chromatogr. A*, 719 (1996) 69-76.
- 982 Sibamato, S., Wada, T., Kato, T. and Hine, T.: (Analysis of pesticides residues with capillary gas chromatography). *Kankyo Kagaku*, 5 (1995) 566-567; *C.A.*, 123 (1995) 332603d.
- 983 Torres, C.M., Picó, Y. and Manes, J.: Analysis of pesticide residues in fruit and vegetables by matrix solid-phase dispersion (MSPD) and different gas chromatography element-selective detectors. *Chromatographia*, 41 (1995) 685-692.
- 984 Torres, C.M., Picó, Y., Redondo, M.J. and Manes, J.: Matrix solid-phase dispersion extraction procedure for multiresidue pesticide analysis in oranges. *J. Chromatogr. A*, 719 (1996) 95-103.
- See also 991, 1052.
- 29b. Chlorinated insecticides  
985 Alder, L. and Vieth, B.: A congener-specific method for the quantification of camphechlor (toxaphene) residues in fish and other foodstuffs. *Fresenius J. Anal. Chem.*, 354 (1996) 81-92.
- 986 Barcelo, D. and Hennion, M.-C.: On-line sample handling strategies for the trace-level determination of pesticides and their degradation products in environmental waters. *Anal. Chim. Acta*, 318 (1995) 1-41.
- 987 De Cruz, I., Lacroix, G., Mougin, C. and Grolleau, G.: Residues of chlorinated pesticides in eggs of the gray heron (*Ardea cinerea* L.): contribution of capillary gas chromatography ion-trap mass detection. *J. High Resolut. Chromatogr.*, 19 (1996) 62-64.
- 988 Guardino, X., Serra, C., Obiols, J., Rosell, M.G., Berenguer, M.J., López, F. and Brosa, J.: Determination of DDT and related compounds in blood samples from agricultural workers. *J. Chromatogr. A*, 719 (1996) 141-147.
- 989 Jaszcynski, J.R., Grzeskiewicz, S. and Obiedzinski, M.W.: Studies on flash semimicro method of organochlorine pesticide determination in edible oils and fats by HRGC-ECD/C-O-C. *Acta Chromatogr.*, 4 (1995) 117-125; *C.A.*, 123 (1995) 283902q.
- 990 Koenig, W.A., Hardt, I.H., Gehrkne, B., Hochmuth, D.H., Huehnerfuss, H., Pfaffenberger, B. and Rimkus, G.: (Optically active reference substances for environmental analysis by preparative enantioselective gas chromatography). *Angew. Chem.*, 106 (1994) 2175-2177; *C.A.*, 123 (1995) 305673v.
- 991 Lepri, L., Disideri, P., Cini, R., Masi, F. and van Erk, M.S.: Transport of organochlorine pesticides across the air/sea interface during the aerosol process. *Anal. Chim. Acta*, 317 (1995) 149-160.
- 992 Magdic, S. and Pawliszyn, J.B.: Analysis of organochlorine pesticides using solid-phase microextraction. *J. Chromatogr. A*, 723 (1996) 111-122.
- 993 Polese, L., Minelli, E.V., Jardin, E.F.G. and Ribeiro, M.L.: Small-scale method for the determination of selected organochlorine pesticides in soil. *Fresenius J. Anal. Chem.*, 354 (1996) 474-476.
- See also 856.
- 29c. Phosphorus insecticides  
994 Gu, M. and Luo, Y.: Determination of thermo-labile organophosphorus pesticide phoxim by capillary gas chromatography. *Sepu (Chin. J. Chromatogr.)*, 13 (1995) 470-471.

995 Liu, W. and Lu, J.: (Determination of dimethoate residue in water by capillary gas chromatography). *Fenxi Huaxue*, 23 (1995) 1229; *C.A.*, 123 (1995) 295986m.

996 Miki, A., Tsuchihashi, H., Ueda, K. and Yamashita, M.: Gas chromatographic determination and gas chromatographic-mass spectrometric determination of dialkyl phosphates via extractive pentafluorobenzylation using a polymeric phase-transfer catalyst. *J. Chromatogr. A*, 718 (1995) 383-389.

#### 29e. Herbicides

997 Alzaga, R., Bayona, J.M. and Barceló, D.: Supercritical fluid extraction of atrazine and its metabolites from soil. *J. High Resolut. Chromatogr.*, 19 (1996) 23-26.

998 Bauerle, G.F.Jr., Ray, K.L. and Brotbelt, J.S.: Determination of pyrethroid insecticides by ion trap GC-MS-MS. *Anal. Chim. Acta*, 317 (1995) 137-148.

999 García-Valcárcel, A.I., Sánchez-Brunete, C., Martínez, L. and Tadeo, J.L.: Determination of dinitroaniline herbicides in environmental samples by gas chromatography. *J. Chromatogr. A*, 719 (1996) 113-119.

1000 Guo, X.: (Gas chromatographic (GC) determination of pyrazosulfuron). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 67-68.

1001 Martinez, E. and Barceló, D.: The stability of selected herbicides preconcentrated from estuarine river waters on solid-phase extraction disks. *Chromatographia*, 42 (1996) 72-76.

1002 Rouberty, F. and Fournier, J.: Modelling of GC and HPLC separations of simazin and atrazin by experimental design methodology. *Chromatographia*, 41 (1995) 553-560.

1003 Stout, S.J., daCunha, A.R. and Allardice, D.G.: Microwave-assisted extraction coupled with gas chromatography/electron capture negative chemical ionization mass spectrometry for the simplified determination of imidazolinone herbicides in soil at the ppb level. *Anal. Chem.*, 68 (1996) 653-658.

1004 Ternes, T.A., Baumann, W. and Nagel, R.: Contributions to the analysis of organic xenobiotics in fish. II. Method for the determination of chlorophenoxy herbicides in fish using GC/MS. *Fresenius J. Anal. Chem.*, 354 (1996) 237-240.

1005 Van der Hoff, G.R., Pelusio, F., Brinkman, U.A.T., Baumann, R.A. and van Zoonen, P.: Automated solid-phase extraction coupled to gas chromatography with electron-capture detection: a combination of extraction and clean-up of pyrethroids in the analysis of surface water. *J. Chromatogr. A*, 719 (1996) 59-67.

1006 Yasin, M., Baugh, P.J., Hancock, P., Bonwick, G.A., Davies, D.H. and Armitage, R.: Synthetic pyrethroid insecticides analysis by gas chromatography/mass spectrometry operated in negative-ion chemical ionization mode in soil, moss and fish tissue. *Rapid Commun. Mass Spectrom.*, 9 (1995) 1411-1417; *C.A.*, 123 (1995) 348396z.

#### 29f. Fungicides

1007 Rouberty, F. and Fournier, J.: Capillary gas chromatographic - mass spectrometric determination of iprodione in chicory and leek. *Chromatographia*, 41 (1995) 693-696.

### 31. PLASTICS AND THEIR INTERMEDIATES

1008 Käppler, K., Scheim, U., Keidel, F. and Just, U.: Identification of low molecular vaporizable components in silicone resins using gas chromatography/mass spectrometry. *Fresenius J. Anal. Chem.*, 354 (1996) 21-26.

1009 Lou, X., Janssen, H.-G. and Cramers, C.A.: Investigation of parameters affecting the supercritical fluid extraction of polymer additives from polyethylene. *J. Microcolumn Sep.*, 7 (1995) 303-317.

1010 Nemtoi, G. and Beldie, C.: Thermodynamic characterization of some copolymers by gas-chromatographic measurements. *Rev. Roum. Chim.*, 40 (1995) 335-341; *C.A.*, 123 (1995) 341607k.

1011 Ohtani, H.: (Characterization of polymeric materials by high-performance pyrolysis-GC/MS). *Bunseki Kagaku*, 45 (1996) 135-156.

1012 Venema, A. and Boom-van-Geest, R.C.A.: *In-situ* hydrolysis/methylation pyrolysis CGC for the characterization of polyaramides. *J. Microcolumn Sep.*, 7 (1995) 337-343.

1013 Wang, F.C.-Y. and Smith, P.B.: Compositional and structural studies of vinylidene chloride/vinyl chloride copolymers by pyrolysis gas chromatography. *Anal. Chem.*, 68 (1996) 425-430.

### 32. DRUG ANALYSIS

#### 32a. Drug analysis, general techniques

1014 Goosens, E.C., Stegman, K.H., de Jong, D., de Jong, G.J. and Brinkman, U.A.T.: Investigation of on-line reversed-phase liquid chromatography-gas chromatography-mass spectrometry as a tool for the identification of impurities in drug substances. *Analyst (Cambridge)*, 121 (1996) 61-66.

1015 Wehmeyer, K.R., Knight, P.M. and Parry, R.C.: Evaluation of a benchtop ion trap gas chromatographic-tandem mass spectrometric instrument for the analysis of a model drug, tebufelone, in plasma using a stable-isotope internal standard. *J. Chromatogr. B*, 676 (1996) 53-59.

#### 32b. Antirheumatics and antiinflammatory drugs

1016 Cardenas, S., Gallego, M., Varcarcel, M., Ventura, R. and Segura, J.: A partially automated pretreatment module for routine analyses for seventeen non-steroid antiinflammatory drugs on race horses using gas chromatography/mass spectrometry. *Anal. Chem.*, 68 (1996) 118-123.

1017 González, G., Ventura, R., Smith, A.K., de la Torre, R. and Segura, J.: Detection of non-steroidal anti-inflammatory drugs in equine plasma and urine by gas chromatography-mass spectrometry. *J. Chromatogr. A*, 719 (1996) 251-264.

1018 Krishna, R., Riggs, K.W., Walker, M.P.R., Kwan, E. and Rurak, D.W.: Sensitive fused-silica capillary gas chromatographic assay using electron-capture detection for indomethacin in ovine fetal fluids. *J. Chromatogr. B*, 674 (1995) 65-75.

## 32c. Autonomic and cardiovascular drugs

- 1019 Bernal, J.L., del Nozal, M.J., Rivera, J.M., Serna, M.L. and Toribio, L.: Separation of salbutamol and six related impurities by packed column supercritical fluid chromatography. *Chromatographia*, 42 (1996) 89-94.
- 1020 Boyd, D., O'Keefe, M. and Smyth, M.R.: Methods for the determination of  $\beta$ -agonists in biological matrices. *Analyst (Cambridge)*, 121 (1996) 1R-10R - a review with 115 refs.
- 1021 Hartonen, K. and Riekola, M.-L.: Detection of  $\beta$ -blockers in urine by solid-phase extraction-supercritical fluid extraction and gas chromatography-mass spectrometry. *J. Chromatogr. B*, 676 (1996) 45-52.
- 1022 Höld, K.M., de Boer, D., Bos, K.L., van Ooijen, R.D., Zuidema, J. and Maes, R.A.A.: Enantioselective quantitation of (*R*)- and (*S*)-alprenolol by gas chromatography-mass spectrometry in human saliva and plasma. *J. Chromatogr. Sci.*, 34 (1996) 13-19.
- 1023 Nagasawa, M., Kashimoto, M., Sugawara, M. and Kimura, Y.: Determination of  $\beta$ -blocker carteolol in human plasma by a sensitive gas chromatographic-negative-ion chemical ionization high-resolution mass spectrometric method. *J. Chromatogr. B*, 674 (1995) 294-298.

## 32d. Central nervous system drugs

- 1024 Clark, C.R., DeRuiter, J. and Noggle, F.T.: Analysis of 1-(3-methoxy-4,5-methylenedioxophenyl)-2-propanamine (MMDA) derivatives synthesized from nutmeg oil and 3-methoxy-4,5-methylenedioxobenzaldehyde. *J. Chromatogr. Sci.*, 34 (1996) 34-42.
- 1025 Gu, M., Feng, C. and Luo, Y.: (Determination of elementar ratio in eighteen soporific and sedative drugs by GC-AED and its application in human whole blood sample). *Sepu (Chin. J. Chromatogr.)*, 14 (1996) 33-36.
- 1026 Krogh, M., Johansen, K., Tønnesen, F. and Rasmussen, K.E.: Solid-phase microextraction for the determination of the free concentration of valproic acid in human plasma by capillary gas chromatography. *J. Chromatogr. B*, 674 (1995) 299-305.
- 1027 Martens, J.: Determination of loratadine and pheniramine from human serum by gas chromatography-mass spectrometry. *J. Chromatogr. B*, 674 (1995) 183-188.
- 1028 Ôi, N., Kitahara, H., Matsushita, Y. and Kisui, N.: Enantiomer separation by gas and high-performance liquid chromatography with tripeptide derivatives as chiral stationary phases. *J. Chromatogr. A*, 722 (1996) 229-232.
- 1029 Seno, H., Hattori, H., Kurono, S., Yamada, T., Kumazawa, T., Ishii, A. and Suzuki, O.: Gas chromatography with surface ionization detection: a highly sensitive method for determining un derivatized codeine and dihydrocodeine in body fluids. *J. Chromatogr. B*, 674 (1995) 189-195.
- 1030 Stanke, F., Jourdin, N., Bessard, J. and Bessard, G.: Simultaneous determination of zolpidem and zopiclone in human plasma by gas chromatography-nitrogen-phosphorus detection. *J. Chromatogr. B*, 675 (1996) 43-51.
- 1031 Szeitz, A., Riggs, K.W. and Harvey-Clark, C.: Sensitive and selective assay for fentanyl using gas chromatography with mass selective detection. *J. Chromatogr. B*, 675 (1996) 33-42.

- 1032 Valentine, J.L., Kearns, G.L., Sparks, C., Letzig, L.G., Valentine, C.R., Shappell, S.A., Neri, D.F. and Dejohn, C.A.: GC-MS determination of amphetamine and methamphetamine in human urine for 12 hours following oral administration of dextro-methamphetamine: lack of evidence supporting the established forensic guidelines for methamphetamine confirmation. *J. Anal. Toxicol.*, 19 (1995) 581-590; *C.A.*, 123 (1995) 332235k.

See also 945.

## 32e. Chemotherapeutics (exc. cytostatics and antibiotics)

- 1033 Parks, O.W., Lightfield, A.R. and Maxwell, R.J.: Effect of sample matrix dehydration during supercritical fluid extraction on the recoveries of drug residues from fortified chicken liver. *J. Chromatogr. Sci.*, 33 (1995) 654-657.

See also 1077.

## 32f. Cytostatics

- 1034 Jagota, N.K., Nair, J.B., Frazer, R., Klee, M. and Wang, M.Z.: Supercritical fluid chromatography of paclitaxel. *J. Chromatogr. A*, 721 (1996) 315-322.
- 1035 Sakiyama, N., Kataoka, H. and Makita, M.: Selective and sensitive determination of pamidronate in human plasma and urine by gas chromatography with flame photometric detection. *Biomed. Chromatogr.*, 9 (1995) 243-245.
- 1036 Sessink, P.J.M., Vaes, W.H.J., van de Broek, P.H.H., Noordhoek, J. and Bos, R.P.: Determination of cyclophosphamide metabolites by gas chromatography and thermionic specific detection. Interindividual differences in hepatic biotransformation of cyclophosphamide in man *in vitro*. *J. Chromatogr. B*, 674 (1995) 205-212.
- 1037 Wang, J.J.-H. and Chan, K.K.: Analysis of ifosfamide, 4-hydroxy-ifosfamide, N2-dechloroethylifosfamide, N3-dechloroethylifosfamide and iphosphoramide mustard in plasma by gas chromatography-mass spectrometry. *J. Chromatogr. B*, 674 (1995) 205-217.

## 32h. Toxicological and forensic applications

- 1038 Cirimele, V., Kintz, P., Majdalani, R. and Mangin, P.: Supercritical fluid extraction of drugs in drug addict hair. *J. Chromatogr. B*, 674 (1995) 173-181.
- 1039 Hashimoto, K., Ivanov, V.V., Inomata, K., Kawai, T., Mizunuma, K., Klimatskaya, L.G. and Fefelova, Y.A.: (Biological monitoring of exposure to alkylating xenobiotics through their determination in the compounds having hemoglobin, plasma proteins, and urinary mercapturic acids, by using a new analytical approach. II. Acrylamide). *Vopr. Med. Khim.*, 41, No. 4 (1995) 22-25; *C.A.*, 123 (1995) 278176b.
- 1040 Ivanov, V.V., Hashimoto, K., Inomata, K., Kawai, T., Nizunuma, K. and Klimatskaya, L.G.: (Biological monitoring of exposure to alkylating xenobiotics through their detection in the compounds having plasma proteins, hemoglobin, and urinary mercapturic acids in rats and in industrial worker. I. Acrylonitrile). *Vopr. Med. Khim.*, 41, No. 4 (1995) 18-22; *C.A.*, 123 (1995) 278175a.

- 1041 Malcolm, M.J., Hudson, J.C., Proulx, J.G.F., Sharp, M.E. and Whiting, C.: Internal quality control of a general GC drug screen in forensic toxicology: experience, questions, proposals. *J. - Can. Soc. Forensic Sci.*, 28 (1995) 215-228; *C.A.*, 123 (1995) 308276d.
- 1042 Mueller, R.K., Grosse, J., Lang, R. and Thieme, D.: Chromatographic techniques-the basis of doping control. *J. Chromatogr. B*, 674 (1995) 1-11 - a review with 16 refs.

See also 964, 988.

### 32i. Plant extracts

- 1043 Ono, H., Matsuzaki, Y., Wakui, Y., Takeda, S., Ikeya, Y., Amanaga, S. and Maruno, M.: Determination of schizandrin in human plasma by gas chromatography-mass spectrometry. *J. Chromatogr. B*, 674 (1995) 293-297.

See also 954.

### 33. CLINICO-CHEMICAL APPLICATIONS

- 33b. *Complex mixtures and profiling (single compounds by cross-reference only)*
- 1044 Skopp, G., Aderjan, R. and Koster, J.: (Hair analysis in the diagnosis of toxic hepatitis after drug abuse with ecstasy). *Dtsch. Med. Wochenschr.*, 120 (1995) 1165-1168; *C.A.*, 123 (1995) 278190b.

See also 839, 877, 892, 928, 943, 951, 1025, 1035, 1036.

### 34. FOOD ANALYSIS

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

- 1045 Heikes, D.L., Jensen, S.R. and Fleming-Jones, M.E.: Purge and trap extraction with GC-MS determination of volatile organic compounds in table-ready foods. *J. Agric. Food Chem.*, 43 (1995) 2869-2875.
- 1046 Pinnel, V., Rosseels, P. and Vandegans, J.: Fingerprint of apple juices by purge and trap GC-MS. *J. High Resolut. Chromatogr.*, 18 (1995) 776-780.

See also 820, 835, 855, 878, 880, 893, 897, 901, 910, 912, 919, 921, 930, 931, 949, 983, 985, 987, 989, 1007.

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

- 1047 Antonelli, A. and Galli, M.: Determination of volatiles in spirits using combined stationary phases in capillary GC. *Chromatographia*, 41 (1995) 722-725.
- 1048 Coleman, W.M., III.: A chromatographic study of the influence of ion concentrations and pH on the yield of volatile materials from heat-treated natural product extracts. *J. Chromatogr. Sci.*, 34 (1996) 1-6.

- 1049 Falque Lopez, E., Darriet, P., Fernandez Gomez, E. and Dubourdieu, D.: (Wine aroma compounds by GC-MS sniffing). *Alimentaria (Madrid)*, 264 (1995) 81-84; *C.A.*, 123 (1995) 337705y.
- 1050 Garcia-Jares, C.M., Garcia-Martin, M.S., Carro-Marino, N. and Cela-Torrijos, R.: GC-MS identification of volatile components of Galician (Northwestern Spain) white wines. Application to differentiate Rias Baixas wines from wines produced in nearby geographical regions. *J. Sci. Food Agric.*, 69 (1995) 175-184; *C.A.*, 123 (1995) 312621e.

See also 939.

### 35. ENVIRONMENTAL ANALYSIS

35a. *General papers and reviews*

- 1051 Bergård, A., Colmsjö, A. and Melin, J.: Assessing breakthrough times for denuder samplers with emphasis on volatile organic compounds. *J. Chromatogr. A*, 723 (1996) 301-311.
- 1052 Mol, H.G.J., Althuizen, M., Janssen, H.-G., Cramers, C.A. and Brinkman, U.A.T.: Environmental applications of large volume injection in capillary GC using PTV injectors. *J. High Resolut. Chromatogr.*, 19 (1996) 69-79.
- 35b. *Air pollution (complex mixtures; single compounds by cross-reference only)*
- 1053 D'Erl, G.M., Cappuccia, N., Colli, M. and Molina, V.: Gas chromatography of 4,4'-diphenylmethane diisocyanate in the workplace atmosphere. *J. Chromatogr. A*, 718 (1995) 141-146.

See also 810, 840, 842, 856, 859, 861, 946, 1073.

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

- 1054 Chen, Z., Wang, X. and Lou, C.: (Quantitative determination of semi-volatile organic compounds in industrial wastewater by GC-MS). *Shanghai Huajing Kexue*, 14, No. 3 (1995) 22-25; *C.A.*, 123 (1995) 295951t.
- 1055 Hanada, Y., Kadokami, K., Shiraishi, H., Imamura, K., Suzuki, S., Hasegawa, A. and Murayama, H.: (Identification of chemical substances in environmental samples by gas chromatography/mass spectrometry). *Kankyo Kagaku*, 5 (1995) 47-64; *C.A.*, 123 (1995) 305674w.
- 1056 Jeon, C.W., Lee, S.H. and Eum, C.H.: (Analysis of volatile organic compounds in water by modified injection mode for purge and trap-GC/MS method). *J. Korean Chem. Soc.*, 39 (1995) 635-642; *C.A.*, 123 (1995) 321513y.
- 1057 Kessels, H., Hoogerwerf, W. and Lips, J.: (Determination of volatile organic compounds by EPA Method 524.2 using capillary gas chromatography with purging and trapping, ECD and FID). *Tec. Lab.*, 17 (1995) 369-379; *C.A.*, 123 (1995) 295992g.
- 1058 Takahashi, Y., Nakagawa, J., Hosokawa, N., Asano, M. and Morita, M.: (Identification and determination of organic compounds in a river water). *Kankyo Kagaku*, 5 (1995) 207-214; *C.A.*, 123 (1995) 349623h.

See also 843, 858, 863, 864, 871, 876, 941, 962, 972, 974, 979, 980, 986, 995, 1001, 1005.

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

See 834, 846, 851, 852, 861, 862, 866, 872, 873, 966, 969, 981, 993, 997, 1003, 1055, 1059, 1060, 1068.

### 36. SOME TECHNICAL PRODUCTS AND COMPLEX MIXTURES

#### 36b. *Antioxidants and preservatives*

1059 Sklarew, D.S., Ozanich, R.M., Lee, R.N., Amonette, J.E., Wright, B.W. and Riley, R.G.: Supercritical fluid versus Soxhlet extraction with FTIR or GC detection of tributylphosphate and lard oil from sediments: Recoveries. *J. Chromatogr. Sci.*, 33 (1995) 622-630.

See also 964.

36c. *Complex mixtures, technical products and unidentified compounds*

1060 Barrio, M.E., Lliberia, J.L., Cornellà, L. and Broto-Puig, F.: Pyrolysis-gas chromatography applied to the study of organic matter evolution in sewage sludge-amended soils using nitrogen-phosphorus, flame ionization and mass spectrometric detection. *J. Chromatogr. A*, 719 (1996) 131-139.

1061 Beens, J. and Tijssen, R.: An on-line coupled HPLC-HRGC system for the quantitative characterization of oil fractions in the middle distillate range. *J. Microcolumn Sep.*, 7 (1995) 345-354.

1062 Berger, T.A.: Separation of a gasoline on an open tubular column with 1.3 million effective plates. *Chromatographia*, 42 (1996) 63-71.

1063 Burg, P., Selves, J.-L. and Colin, J.P.: Numerical simulation of crude oil behaviour from chromatographic data. *Anal. Chim. Acta*, 317 (1995) 107-125.

1064 Ding, W.-H., Fujita, Y., Aeschimann, R. and Reinhard, M.: Identification of organic residue in tertiary effluents by GC/EI-MS, GC/CI-MS and GC/TSQ-MS. *Fresenius J. Anal. Chem.*, 354 (1996) 48-55.

1065 Mezhevich, G.V., Kravchenko, N.V. and Buller, M.F.: (Method for analysis of celluloid involving extraction and gas chromatography). Russ. RU 2,034,293 (Cl. G01N30/06), 30 Apr. 1995, SU Appl. 5,046,246, 5 Jun. 1992; pp. 207-208; C.A., 123 (1995) 3580392.

1066 Rietjens, M. and Wils, E.R.J.: Characterization of plastic-bonded explosives by pyrolysis gas chromatography and multivariate data analysis. Part II: aging studies. *Propellants, Explos., Pyrotech.*, 20 (1995) 232-237; C.A., 123 (1995) 344969r.

1067 Vodyankina, O.V. and Galanov, S.I.: (Chromatographic determination of the products of catalytic vapor-phase oxidation of ethylene glycol to glyoxal). *Zavod. Lab.*, 61, No. 8 (1995) 12-13.

1068 Wang, Z. and Fingas, M.: Using biomarker compounds to track the source of spilled oil and to monitor the oil weathering process. *LC-GC*, 13 (1995) 950-958.

1069 Yokoyama, S., Nakamura, H., Itoh, Y., Satou, M., Sanada, Y., Suzuki, M. and Machihara, T.: (GC-MS/MS analyses of coal hydrogenation oil). *Nippon Enerugi Gakkaishi*, 74 (1995) 722-730; C.A., 123 (1995) 318448a.

1070 Zhang, M., Tang, R., Shen, S., He, X. and Chen, B.: Compositional studies of high-temperature coal tar by capillary gas chromatography/Fourier transform infrared - analysis of middle oil fractions. *Sepu (Chin. J. Chromatogr.)*, 13 (1995) 418-423.

See also 732, 733, 740, 831, 836, 844, 846, 847, 853, 875, 902, 960, 971.

### 37. CELLS, CELLULAR PARTICLES AND SUPRAMOLECULAR STRUCTURES

1071 Yin, Z. and Yuhui, Z.: Differentiation of nonphotochromogens mycobacteria with pyrolysis-methylation gas chromatography. *Sepu (Chin. J. Chromatogr.)*, 13 (1995) 411-414.

### 38. INORGANIC COMPOUNDS

#### 38c. *Permanent and rare gases*

1072 Guangda, L., Guoqiang, J. and Cansheng, S.: An experimental investigation for hydrogen and deuterium separation by thermal cycling absorption process. *Fusion Technol.*, 28, No. 3, Pt. 1 (1995) 672-675; C.A., 123 (1995) 299460e.

See also 1079.

#### 38d. *Volatile inorganic compounds*

1073 Hunt, A.I. and Alder, J.F.: Quantitative analysis of chlorine in air by gas chromatography. *Anal. Communs. (formerly Anal. Proc.)*, 33 (1996) 61-64.

1074 Kage, S., Nagata, T. and Kudo, K.: Determination of cyanide and thiocyanate in blood by gas chromatography and gas chromatography-mass spectrometry. *J. Chromatogr. B*, 675 (1996) 27-32.

1075 Kolesar, E.S.Jr. and Reston, R.R.: Silicon-micromachined gas chromatography system used to separate and detect ammonia and nitrogen dioxide. Part II: Evaluation, analysis, and theoretical modeling of the gas chromatography system. *J. Microelectromech. Syst.*, 3 (1994) 147-154; C.A., 123 (1995) 328489d.

1076 Marty, A., Cornet, J.-F., Djelveh, G., Larroche, C. and Gros, J.-B.: A gas phase chromatography method for determination of low dissolved CO<sub>2</sub> concentration and/or CO<sub>2</sub> solubility in microbial culture media. *Biotechnol. Tech.*, 9 (1995) 787-792; C.A., 123 (1995) 334054z.

1077 Ramstad, T., Bates, A.H., Yellig, T.J., Borchert, S.J. and Mills, K.A.: Analysis of hydrogen sulphide gas from a pharmaceutical formulation by cryofocused headspace gas chromatography. *Analyst (Cambridge)*, 120 (1995) 2775-2780.

1078 Wong, E.C.C.: Analysis of carbon disulfide and carbonyl sulfide in blood subject to interference from the same compounds from rubber stoppers. *Clin. Chem. (Washington)*, 41 (1995) 1541-1544.

## 39. RADIOACTIVE AND OTHER ISOTOPE COMPOUNDS

- 1079 Deruaz, D., Bannier, A., Pionchon, C., Boukraa, M.S., Elbast, W. and Brazier, J.L.: Limit of detection of  $^{15}\text{N}$  by gas-chromatography atomic emission detection. Optimization using an experimental design. *Anal. Lett.*, 28 (1995) 2095-2113.

See also 874, 1072.