

# REFERENCES

## References

- van Aarssen, B.G.K., Cox, H.C., Hoogendoorn, P., and de Leeuw, J.W. (1990a) A cadinene biopolymer in fossil and extant dammar resins as a source for cadinanes and bicadinanes in crude oils from South East Asia. *Geochimica et Cosmochimica Acta* **54**, 3021-3031.
- van Aarssen, B.G.K., Kruk, C., Hessels, J.K.C., and de Leeuw, J.W. (1990b) *cis-cis-trans*-bicadinane, a novel member of an uncommon triterpane family isolated from crude oils. *Tetrahedron Letters* **31**, 4645-4648.
- Abas, M.R.B., Simoneit, B.R.T., Elias, V., Cabral, J.A., and Cardoso, J.N. (1995) Composition of higher molecular weight organic matter in smoke aerosol from biomass combustion in Amazonia. *Chemosphere* **30**, 995-1015.
- Abas, M.R.B., and Simoneit, B.R.T. (1996) Composition of extractable organic matter of air particles from Malaysia: Initial study. *Atmospheric Environment* **30**, 2779-2793.
- Abas, M.R.B., and Simoneit, B.R.T. (1998) Wax lipids from leaf surfaces of some common plants of Malaysia. *Pertanika Journal of Science and Technology* **6**, 171-182.
- Aceves, M., and Grimalt, J.O. (1992) Gas chromatographic screening of organic compounds in urban aerosols: I. Selectivity effects in semi-polar columns. *Journal of Chromatography* **607**, 261-270.
- Aceves, M., and Grimalt, J.O. (1993a) Gas chromatographic screening of organic compounds in urban aerosols: II. Changes in hydrocarbon composition during storage. *Journal of Chromatography A* **655**, 133-140.
- Aceves, M., and Grimalt, J.O. (1993b) Large and small particle size screening of organic compounds in urban air. *Atmospheric Environment* **27B**, 251-263.
- Ageta, H., Iwata, K., and Natori, S. (1964) Fern constituents: Adianene, filicene, 7-fernene, isofernene, and diploptene. Triterpenoid hydrocarbons isolated from *Adiantum monochlamys*. *Tetrahedron Letters* **46**, 3413-3418.
- Air Quality Guidelines for Europe* (1987) WHO, p. 105.
- Albro, P.W. (1976) Bacterial waxes. In: *Chemistry and Biochemistry of Natural Waxes* (Kolattukudy, P.E., editor) Elsevier, Amsterdam, p. 419-445.
- Anderson, R., Kates, M., Baedecker, M.J., Kaplan, I.R., and Ackman, R.G. (1977) The stereoisomeric composition of phytanyl chains in lipids of Dead Sea sediments. *Geochimica et Cosmochimica Acta* **41**, 1381-1390.

- Baek, S.O., Goldstone, M.E., Kirk, P.W.W., Lester, J.N., and Perry, R.** (1991) Methodological aspects of measuring polycyclic aromatic hydrocarbons in the urban atmosphere. *Environmental Technology* **12**, 107-129.
- Baker, E.A.** (1974) The influence of environment on leaf wax development in *Brassica oleracea* var. *gemmifera*. *New Phytology* **73**, 955-966.
- Barnabas, I.J., Dean, J.R., Tomlinson, W.R., and Owen, S.P.** (1995) Experimental design approach for the extraction of polycyclic aromatic hydrocarbons from soil using supercritical carbon dioxide. *Analytical Chemistry* **67**, 2064-2069.
- Bendoraitis, J.G., Brown, B.L., and Hepner, L.S.** (1962) Isoprenoid hydrocarbons in petroleum. Isolation of 2,6,10,14-tetramethylpentadecane by high temperature gas-liquid chromatography. *Analytical Chemistry* **34**, 49-53.
- Berezkin, V.G., and Drugov, Y.S.** (1991) *Gas Chromatography in Air Pollution Analysis*, Elsevier, Amsterdam, p. 4, 6.
- Bird, C.W., and Lynch, J.M.** (1974) Formation of hydrocarbons by micro-organisms. *Chemical Society Reviews* **3**, 309-328.
- Boon, J.J., Rijpstra, W.I.C., de Lange, F., de Leeuw, J.W., Yoshioka, M., and Shimizu, Y.** (1979) Black Sea sterol- a molecular fossil for dinoflagellate blooms. *Nature* **277**, 125-127.
- Boone, P.M., and Macias, E.S.** (1987) Methyl alkanes in atmospheric aerosols. *Environmental Science and Technology* **21**, 903-909.
- Bovallius, Å., Bucht, B., Roffey, R., and Ånäs, P.** (1978) Three-year investigation of the natural airborne bacterial flora at four localities in Sweden. *Applied and Environmental Microbiology* **35**, 847-852.
- Bray, E.E., and Evans, E.D.** (1961) Distribution of n-paraffins as a clue to recognition of source beds. *Geochimica et Cosmochimica Acta* **22**, 2-15.
- Brooks, J.D., Gould, K., and Smith, J.W.** (1969) Isoprenoid hydrocarbons in coal and petroleum. *Nature* **222**, 257-259.
- Caricchia, A.M., Chiavarini, S., Cremisini, C., Fantini, M., Morabito, R., Perini, A., and Pezza, M.** (1993) PAHs in atmospheric particulate in the area of Italian scientific base in Antarctica. *Water Science and Technology* **27**, 235-243.
- Chappe, B., Albrecht, P., and Michaelis, W.** (1982) Polar lipids of archaebacteria in sediments and petroleums. *Science* **217**, 65-66.
- Clarke, A.G.** (1992) The Atmosphere. In: *Understanding Our Environment: An Introduction to Environmental Chemistry and Pollution* (Harrison, R.M., editor), 2<sup>nd</sup> edition, Royal Society of Chemistry, Cambridge, p. 5-51.
- Connan, J.** (1981) Biological markers in crude oils. In: *Petroleum Geology in China* (Mason, J.F., editor) PennWell, Tulsa, Oklahoma, p. 48-70.

- Cook, R.H. (1983) *Polycyclic Aaromatic Hydrocarbons in the Aquatic Environment: Formation Sources, Fate and Effects on Aquatic Biota*, Crown, p. 9-31.
- Cooper, J.E., and Bray, E.E. (1963) A postulated role of fatty acids in petroleum formation. *Geochimica et Cosmochimica Acta* **27**, 1113-1127.
- Cox, H.C., de Leeuw, J.W., Schenck, P.A., van Koningsveld, H., Jansen, J.C., van de Graaf, B., van Geerestein, V.J., Kanter, J.A., Kruk, C., and Jans, A.W.H. (1986) Bicinane, a C<sub>30</sub> pentacyclic isoprenoid hydrocarbon found in crude oil. *Nature* **319**, 316-318.
- Cox, R.E., Mazurek, M.A., and Simoneit, B.R.T. (1982) Lipids of Harmattan aerosols of Nigeria. *Nature* **296**, 848-849.
- Dean, J.R., Barnabas, I.J., and Fowles, I.A.** (1995) Extraction of polycyclic aromatic hydrocarbons from highly contaminated soils: a comparison between Soxhlet, microwave and supercritical fluid extraction techniques. *Analytical Proceedings Including Analytical communications* **32**, 305-308.
- Department of Environment (DOE), Malaysia (1998) Environmental Quality Report 1998, Ministry of Science, Technology and the Environment, Kuala Lumpur, Malaysia.
- Didyk, B.M., Simoneit, B.R.T., Brassell, S.C., and Eglinton, G. (1978) Organic geochemical indicators of palaeoenvironmental conditions of sedimentation. *Nature* **272**, 216-222.
- Didyk, B.M., Simoneit, B.R.T., Pezoa, L.A., Riveros, M.L., and Flores, A.A. (2000) Urban aerosol particles of Santiago, Chile: organic content and molecular characterization. *Atmospheric Environment* **34**, 1167-1179.
- DiNardi, S.R. (1994) Exposure and Environmental Characterization. In: *Air Pollution and Lung Disease in Adults* (Witorsch, P., and Spagnolo, S.V., editors), Lewis Publishers, Boca Raton, FL, p. 1-16.
- Eglinton, G., and Hamilton, R.J.** (1967) Leaf epicuticular waxes. *Science* **156**, 1322-1335.
- Eglinton, G., Gonzalez, A.G., Hamilton, R.J., and Raphael, R.A. (1962) Hydrocarbon constituents of the wax coatings of plant leaves: a taxonomic survey. *Phytochemistry* **1**, 89-102.
- Escrivá, C., Viana, E., Moltó, J.C., Picó, Y., and Mañes, J. (1994) Comparison of four methods for the determination of polycyclic aromatic hydrocarbons in airborne particulates. *Journal of Chromatography A* **676**, 375-388.
- Fang, M., Zheng, M., Wang, F., To, K.L., Jaafar, A.B., and Tong, S.L.** (1999) The solvent-extractable organic compounds in the Indonesia biomass burning aerosols – characterization studies. *Atmospheric Environment* **33**, 783-795.
- Finlayson-Pitts, B.J., and Pitts, J.N., Jr. (1986) *Atmospheric Chemistry: Fundamentals and Experimental Techniques*, John Wiley and Sons, NY, p. 877-895.



- Giger, W., and Schaffner, C. (1978) Determination of polycyclic aromatic hydrocarbons in the environment by glass capillary gas chromatography. *Analytical Chemistry* **50**, 243-249.
- Giger, W., Schaffner, C., and Wakeham, S.G. (1980) Aliphatic and olefinic hydrocarbons in recent sediments of Greifensee, Switzerland. *Geochimica et Cosmochimica Acta* **44**, 119-129.
- Godish, T. (1991) *Air Quality*, 2<sup>nd</sup> edition, Lewis Publishers, Boca Raton, FL, p. 65-173.
- Gogou, A., Stratigakis, N., Kanakidou, M., and Stephanou, E.G. (1996) Organic aerosols in Eastern Mediterranean: components source reconciliation by using molecular markers and atmospheric back trajectories. *Organic Geochemistry* **25**, 79-96.
- Gogou, A., Apostolaki, M., and Stephanou, E.G. (1998) Determination of organic molecular markers in marine aerosols and sediments: one-step flash chromatography compound class fractionation and capillary gas chromatographic analysis. *Journal of Chromatography A* **799**, 215-231.
- Golden, C., and Sawicki, E. (1975) Ultrasonic extraction of total particulate aromatic hydrocarbons (TpAH) from airborne particles at room temperature. *International Journal of Environmental and Analytical Chemistry* **4**, 9-23.
- Grimalt, J., Marfil, C., and Albaigés, J. (1984) Analysis of hydrocarbons in aquatic sediments. *International Journal of Environmental and Analytical Chemistry* **18**, 183-194.
- Grosjean, D. (1983) Polycyclic aromatic hydrocarbons in Los Angeles air from samples collected on Teflon, glass and quartz filters. *Atmospheric Environment* **17**, 2565-2573.
- Grosjean, D., Fung, K., and Harrison, J. (1983) Interactions of polycyclic aromatic hydrocarbons with atmospheric pollutants. *Environmental Science and Technology* **17**, 673-679.
- Gülz, P.-G., Müller, E., and Prasad, R.B.N. (1991) Developmental and seasonal variations in the epicuticular waxes of *Tilia tomentosa* leaves. *Phytochemistry* **30**, 769-773.
- Haines, J.R., and Alexander, M. (1974) Microbial degradation of high-molecular-weight alkanes. *Applied Microbiology* **28**, 1084-1085.
- Hart, K.M., and Pankow, J.F. (1994) High-volume air sampler for particle and gas sampling. 2. Use of backup filters to correct for the adsorption of gas-phase polycyclic aromatic hydrocarbons to the front filter. *Environmental Science and Technology* **28**, 655-661.
- Hart, K.M., Isabelle, L.M., and Pankow, J.F. (1992) High-volume air sampler for particle and gas sampling. 1. Design and gas sampling performance. *Environmental Science and Technology* **26**, 1048-1052.

- Hauser, T.R., and Pattison, J.N. (1972) Analysis of aliphatic fraction of air particulate matter. *Environmental Science and Technology* **6**, 549-555.
- ten Haven, H.L., and Rullkötter, J. (1988) The diagenetic fate of taraxer-14-ene and oleanene isomers. *Geochimica et Cosmochimica Acta* **52**, 2543-2548.
- ten Haven, H.L., de Leeuw, J.W., Rullkötter, J., and Sinninghe Damasté, J.S. (1987) Restricted utility of the pristane/phytane ratio as a palaeoenvironmental indicator. *Nature* **330**, 641-643.
- Hawthorne, S.B., and Miller, D.J. (1987) Extraction and recovery of polycyclic aromatic hydrocarbons from environmental solids using supercritical fluids. *Analytical Chemistry* **59**, 1705-1708.
- Hollender, J., Shneine, J., Dott, W., Heinzel, M., Hagemann, H.W., and Götz, G.K.E. (1997) Extraction of polycyclic aromatic hydrocarbons from polluted soils with binary and ternary supercritical phases. *Journal of Chromatography A* **776**, 233-243.
- Huang, W-Y., and Meinschein, W.G. (1976) Sterols as source indicators of organic materials in sediments. *Geochimica et Cosmochimica Acta* **40**, 323-330.
- Hunt, J.M. (1979) *Petroleum Geochemistry and Geology*, W.H. Freeman and company, San Francisco, p. 42-55, 301, 382.
- Ikan, R., Baedecker, M.J., and Kaplan, I.R.** (1975) Thermal alteration experiments on organic matter in recent marine sediment-II. Isoprenoids. *Geochimica et Cosmochimica Acta* **39**, 187-194.
- Illich, H. (1983) Pristane, phytane, and lower molecular weight isoprenoid distributions in oils. *The American Association of Petroleum Geologists Bulletin* **67**, 385-393.
- Jiao, K., and Lafleur, A.L.** (1997) Improved detection of polycyclic aromatic compounds in complex mixtures by liquid chromatographic fractionation on poly(divinylbenzene) prior to gas chromatography- mass spectrometry. Application to the analysis of diesel particulates. *Journal of Chromatography A* **791**, 203-211.
- John, E.D., and Nickless, G. (1977) Gas chromatographic method for the analysis of major polynuclear aromatics in particulate matter. *Journal of Chromatography* **138**, 399-412.
- Johns, R.B., Belsky, T., McCarthy, E.D., Burlingame, A.L., Haug, P., Schnoes, H.K., Richter, W., and Calvin, M. (1966) The organic geochemistry of ancient sediments-Part II. *Geochimica et Cosmochimica Acta* **30**, 1191-1222.
- Jones, B.L., and Cookson, J.T. (1983) Natural atmospheric microbial conditions in a typical suburban area. *Applied and Environmental Microbiology* **45**, 919-934.
- Jones, F.E. (1994) *Toxic Organic Vapors in Workplace*, Lewis Publishers, Boca Raton, FL, p. 153, 154.
- Kates, M., Palameta, B., Joo, C.N., Kushner, D.J., and Gibbons, N.E.** (1966) Aliphatic diether analogs of glyceride-derived lipids. IV. The occurrence of di-O-

- dihydrophytylglycerol ether containing lipids in extremely halophilic bacteria. *Biochemistry* **5**, 4092-4099.
- Kaupp, H., and Umlauf, G. (1992) Atmospheric gas-particle partitioning of organic compounds: comparison of sampling methods. *Atmospheric Environment* **26A**, 2259-2267.
- Kissin, Y.V. (1990) Acyclic components in dewaxed heavy distillates. *Fuel* **69**, 1283-1291.
- Knecht, U., Elliehausen, H.-J., Judas, W., and Weitowitz, H.-J. (1987) Polycyclic Aromatic Hydrocarbons (PAH) in abraded particles of brake and clutch linings. *International Journal of Environmental and Analytical Chemistry* **28**, 227-236.
- Koh, T-S. (1983) Ultrasonic preparation of fat-free biological materials for elemental analysis. *Analytical Chemistry* **55**, 1814-1815.
- Kolattukudy, P.E. (1976) Introduction to natural waxes. In: *Chemistry and Biochemistry of Natural Waxes* (Kolattukudy, P.E., editor) Elsevier, Amsterdam, p. 1-15.
- Kolattukudy, P.E., Croteau, R., and Buckner, J.S. (1976) Biochemistry of plant waxes. In: *Chemistry and Biochemistry of Natural Waxes* (Kolattukudy, P.E., editor) Elsevier, Amsterdam, p. 289-347.
- König, J., Balfanz, E, Funcke, W., and Romanowski, T. (1983) Determination of oxygenated polycyclic aromatic hydrocarbons in airborne particulate matter by capillary gas chromatography and gas chromatography/mass spectrometry. *Analytical Chemistry* **55**, 599-603.
- Kördel, W., Dassenakis, M., Lintemann, J., and Padberg, S. (1997) The importance of natural organic material for environmental processes in waters and soils. *Pure and Applied Chemistry* **69**, 1571-1600.
- Kulkarni, P., and Venkataraman, C. (2000) Atmospheric polycyclic aromatic hydrocarbons in Mumbai, India. *Atmospheric Environment* **34**, 2785-2790.
- Lam, G.C.K., Leung, D.Y.C., Niewiadomski, M., Pang, S.W., Lee, A.W.F., and Louie, P.K.K. (1999) Street-level concentrations of nitrogen dioxide and suspended particulate matter in Hong Kong. *Atmospheric Environment* **33**, 1-11.
- Larson, R.A., and Weber, E.J. (1994) *Reaction Mechanisms in Environmental Organic Chemistry*, Lewis Publishers, Boca Raton, FL, p. 28-30, 257, 258.
- Lee, C., Farrington, J.W., and Gagosian, R.B. (1979) Sterol geochemistry of sediments from the western North Atlantic Ocean and adjacent coastal areas. *Geochimica et Cosmochimica Acta* **43**, 35-46.
- Lee, H.K. (1995) Recent applications of gas and high-performance liquid chromatographic techniques to the analysis of polycyclic aromatic hydrocarbons in airborne particulates. *Journal of Chromatography A* **710**, 79-92.

- Leeming, R., and Maher, W. (1990) Determination of polycyclic aromatic hydrocarbons in lake sediments. *Organic Geochemistry* **15**, 469-476.
- Lindemann, J., and Upper, C.D. (1985) Aerial dispersal of epiphytic bacteria over bean plants. *Applied and Environmental Microbiology* **50**, 1229-1232.
- Lindemann, J., Constantinidou, H.A., Barchet, W.R., and Upper, C.D. (1982) Plants as sources of airborne bacteria, including ice nucleation-active bacteria. *Applied and Environmental Microbiology* **44**, 1059-1063.
- Lindhardt, B., Holst, H., and Christensen, T.H. (1994) Comparison of Soxhlet and shake extraction of polycyclic aromatic hydrocarbons from coal tar polluted soils sampled in the field. *International Journal of Environmental and Analytical Chemistry* **57**, 9-19.
- Lyall, R.J., Hooper, M.A., and Mainwaring, S.J. (1988) Polycyclic aromatic hydrocarbons in the Latrobe valley. *Atmospheric Environment* **22**, 2549-2555.
- Mackenzie, A.S., Patience, R.L., Maxwell, J.R., Vandenbroucke, M., and Durand, B.** (1980) Molecular parameters of maturation in the Toarcian shales, Paris basin, France-1. Changes in the configurations of acyclic isoprenoid alkanes, steranes, and triterpanes. *Geochimica et Cosmochimica Acta* **44**, 1709-1721.
- Mackenzie, A.S., Brassell, S.C., Eglinton, G., and Maxwell, J.R. (1982) Chemical fossils: the geological fate of steroids. *Science* **217**, 491-504.
- Manahan, S.E. (1994) *Environmental Chemistry*, 6<sup>th</sup> edition, Lewis Publishers, Boca Raton, FL, p. 305-375.
- Marvin, C.H., Allan, L., McCarry, B.E., and Bryant, D.W. (1992) A comparison of ultrasonic extraction and Soxhlet extraction of polycyclic aromatic hydrocarbons from sediments and air particulate material. *International Journal of Environmental and Analytical Chemistry* **49**, 221-230.
- Maxwell, J.R., Pillinger, C.T., and Eglinton, G. (1971) Organic geochemistry. *Chemical Society Quarterly Reviews* **25**, 571-628.
- Mazurek, M.A., and Simoneit, B.R.T. (1984) Characterization of biogenic and petroleum-derived organic matter in aerosols over remote, rural, and urban areas. In: *Identification and Analysis of Organic Pollutants in Air* (Keith L.H., editor) Ann Arbor Science, Woburn, MA, p.353-370.
- Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1991) Biological input to visibility-reducing aerosol particles in the remote arid Southwestern United States. *Environmental Science and Technology* **25**, 684-694.
- Meinschein, W.G., and Kenny, G.S. (1957) Analyses of a chromatographic fraction of organic extracts of soils. *Analytical Chemistry* **29**, 1153-1161.
- Menichini, E., and Monfredini, F. (1995) A field comparison of 'total suspended particles' and 'PM<sub>10</sub>' air samplers in collecting polycyclic aromatic hydrocarbons. *International Journal of Environmental and Analytical Chemistry* **61**, 299-307.

- Miguel, A.H., and de Andrade, J.B. (1989) Rapid quantitation of ten polycyclic aromatic hydrocarbons in atmospheric aerosols by direct HPLC separation after ultrasonic acetonitrile extraction. *International Journal of Environmental and Analytical Chemistry* **35**, 35-41.
- Moldowan, J.M., Seifert, W.K., and Gallegos, E.J. (1985) Relationship between petroleum composition and depositional environment of petroleum source rocks. *The American Association of Petroleum Geologists Bulletin* **69**, 1255-1268.
- Moldowan, J.M., Fago, F.J., Lee, C.Y., Jacobson, S.R., Watt, D.S., Slougui, N-E., Jeganathan, A., and Young, D.C. (1990) Sedimentary 24-n-propylcholestanes, molecular fossils diagnostic of marine algae. *Science* **247**, 309-312.
- Monserate, M., and Olesik, S.V. (1997) Evaluation of SFE-CO<sub>2</sub> and methanol-CO<sub>2</sub> mixtures for the extraction of polynuclear aromatic hydrocarbons from house dust. *Journal of Chromatographic Science* **35**, 82-90.
- Naikwadi, K.P., Charbonneau, G.M., Karasek, F.W., and Clement, R.E. (1987) Separation and identification of organic compounds in air particulate extracts by high-performance liquid chromatography and gas chromatography-mass spectrometry. *Journal of Chromatography* **398**, 227-237.
- Nielsen, T. (1988) The decay of benzo(a)pyrene and cyclopenteno(cd)pyrene in the atmosphere. *Atmospheric Environment* **22**, 2249-2254.
- Nielsen, T., Clausen, P., and Jensen, F.P. (1986) Determination of basic azaarenes and polynuclear aromatic hydrocarbons in airborne particulate matter by gas chromatography. *Analytica Chimica Acta* **187**, 223-231.
- Niessner, R. (1993) Sampling techniques for air pollutants. In: *Environmental Analysis: Techniques, Applications and Quality Assurance* (Barcelò, D., editor) Elsevier, Amsterdam, p. 3-22.
- Niles, R., and Tan, Y.L. (1989) Determination of polynuclear aromatic hydrocarbons and mononitrated derivatives in air and diesel particulates. *Analytica Chimica Acta* **221**, 53-63.
- Oda, J., Maeda, I., Mori, T., Yasuhara, A., and Saito, Y. (1998) The relative proportions of polycyclic aromatic hydrocarbons and oxygenated derivatives in accumulated organic particulates as affected by air pollution sources. *Environmental Technology* **19**, 961-976.
- Ourisson, G., Albrecht, P., and Rohmer, M. (1979) The hopanoids. Palaeochemistry and biochemistry of a group of natural products. *Pure and Applied Chemistry* **51**, 709-729.
- Pasanen, A.-L., Pasanen, P., Jantunen, M.J., and Kalliokoski, P. (1991) Significance of air humidity and air velocity for fungal spore release into the air. *Atmospheric Environment* **25A**, 459-462.
- Peltonen, K., and Kuljucka, T. (1995) Air sampling and analysis of polycyclic aromatic hydrocarbons. *Journal of Chromatography A* **710**, 93-108.

- Peltzer, E.T., and Gagosian, R.B. (1987) Sampling and quantitation of lipids in aerosols from the remote marine atmosphere. *Analytica Chimica Acta* **198**, 125-144.
- Peters, K.E., and Moldowan, J.M. (1993) *The Biomarker Guide: Interpreting Molecular Fossils in Petroleum and Ancient Sediments*, Prentice Hall, Englewood Cliffs, NJ, 363 p.
- Philp, R.P. (1985) *Fossil Fuel Biomarkers: Application and Spectra*, Elsevier, Amsterdam, 294 p.
- Pitts, J.N., Jr., Van Cauwenberghe, K.A., Grosjean, D., Schmid, J.P., Fitz, D.R., Belser, W.L., Jr., Knudson, G.B., and Hynds, P.M. (1978) Atmospheric reaction of polycyclic aromatic hydrocarbons: facile formation of mutagenic nitro derivatives. *Science* **202**, 515-519.
- de Raat, W.K., Bakker, G.L., and de Meijere, F.A. (1990) Comparison of filter materials used for sampling of mutagens and polycyclic aromatic hydrocarbons in ambient airborne particles. *Atmospheric Environment* **24A**, 2875-2887.
- Radojević, M., and Bashkin, V.N. (1999) *Practical Environmental Analysis*, Royal Society of Chemistry, Cambridge, p. 450.
- Rajkumar, W.S., and Chang, A.S. (2000) Suspended particulate matter concentrations along the East-West Corridor, Trinidad, West Indies. *Atmospheric Environment* **34**, 1181-1187.
- Reimer, G., and Suarez, A. (1995) Comparison of supercritical fluid extraction and Soxhlet extraction for the analysis of native polycyclic aromatic hydrocarbons in soils. *Journal of Chromatography A* **699**, 253-263.
- Revuelta, C.C., Santiago, E.d.l.F., and Vázquez, J.A.R. (1999) Characterization of polycyclic aromatic hydrocarbons in emissions from coal-fired power plants: the influence of operation parameters. *Environmental Technology* **20**, 61-68.
- Riederer, M., and Schneider, G. (1990) The effect of the environment on the permeability and composition of *Citrus* leaf cuticles. II. Composition of soluble cuticular lipids and correlation with transport properties. *Planta* **180**, 154-165.
- Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1991) Sources of fine organic aerosol. 1. Charbroilers and meat cooking operations. *Environmental Science and Technology* **25**, 1112-1125.
- Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1993a) Sources of fine organic aerosol. 2. Noncatalyst and catalyst-equipped automobiles and heavy-duty diesel trucks. *Environmental Science and Technology* **27**, 636-651.
- Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1993b) Sources of fine organic aerosol. 3. Road dust, tire debris, and organometallic brake lining dust: roads as sources and sinks. *Environmental Science and Technology* **27**, 1892-1904.

- Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1993c) Sources of fine organic aerosol. 4. Particulate abrasion products from leaf surfaces of urban plants. *Environmental Science and Technology* **27**, 2700-2711.
- Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1993d) Sources of fine organic aerosol. 5. Natural gas home appliances. *Environmental Science and Technology* **27**, 2736-2744.
- Rogge, W.F., Mazurek, M.A., Hildemann, L.M., Cass, G.R., and Simoneit, B.R.T. (1993e) Quantification of urban organic aerosols at a molecular level: identification, abundance and seasonal variation. *Atmospheric Environment* **27A**, 1309-1330.
- Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1994) Sources of fine organic aerosol. 6. Cigarette smoke in the urban atmosphere. *Environmental Science and Technology* **28**, 1375-1388.
- Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1997a) Sources of fine organic aerosol. 7. Hot asphalt roofing tar pot fumes. *Environmental Science and Technology* **31**, 2726-2730.
- Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1997b) Sources of fine organic aerosol. 8. Boilers burning No. 2 distillate fuel oil. *Environmental Science and Technology* **31**, 2731-2737.
- Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R., and Simoneit, B.R.T. (1998) Sources of fine organic aerosol. 9. Pine, oak and synthetic log combustion in residential fireplaces. *Environmental Science and Technology* **32**, 13-22.
- Rubinstein, I., and Strausz, O.P. (1979) Geochemistry of the thiourea adduct fraction from an Alberta petroleum. *Geochimica et Cosmochimica Acta* **43**, 1387-1392.
- Saim, N., Abdullah, M.P., and Zakaria, Z.** (1997) Effect of extraction time and solvent system on the extraction efficiencies of polycyclic aromatic hydrocarbons from soil and sediment. *Simposium Kimia Analisis Malaysia* **10**.
- Samara, C., Manoli, E., and Kipopoulou, A.M. (1995) Profile analysis of polycyclic aromatic hydrocarbons (PAHs) in airborne particulate matter of the area of Thessaloniki, Greece. In: *Air Pollution Engineering and Management* (Power, H., Moussiopoulos, N., and Brebbia, C.A., editors), Air Pollution III, Volume 2, Computational Mechanics, p. 161-176.
- Sandmeyer, E.E. (1981) Aliphatic Hydrocarbons. In: *Patty's Industrial Hygiene and Toxicology* (Clayton, G.D., and Clayton, F.E., editors), 4<sup>th</sup> edition, Vol. II Part B, John Wiley and Sons, NY, p. 3175-3220.
- Sani, S. (1987) *Urbanization and the Atmospheric Environment in the Low Tropics*, Karya Press, Kuala Lumpur, p. 543, 550.
- Schnelle, J., Wolf, K., Frank, G., Hietel, B., Gebefügi, I., and Kettrup, A. (1996) Particle size-dependent concentrations of polycyclic aromatic hydrocarbons. *Analyst* **121**, 1301-1304.

- Seifert, W.K. (1978) Steranes and terpanes in kerogen pyrolysis for correlation of oils and source rocks. *Geochimica et Cosmochimica Acta* **42**, 473-484.
- Seifert, W.K., and Moldowan, J.M. (1978) Applications of steranes, terpanes and monoaromatics to the maturation, migration and source of crude oils. *Geochimica et Cosmochimica Acta* **42**, 77-95.
- Seifert, W.K., and Moldowan, J.M. (1981) Paleoreconstruction by biological markers. *Geochimica et Cosmochimica Acta* **45**, 783-794.
- Shanmugam, G. (1985) Significance of coniferous rain forests and related organic matter in generating commercial quantities of oil, Gippsland basin, Australia. *The American Association of Petroleum Geologists Bulletin* **69**, 1241-1254.
- Shimadzu gas chromatograph (GC-14A) user's manual (1989) Shimadzu Corporation, Kyoto, Japan.
- Shimadzu gas chromatograph (GC-17A) user's manual (1995) Shimadzu Corporation, Kyoto, Japan.
- Sicre, M.A., Marty, J.C., Salot, A., Aparicio, X., Grimalt, J., and Albaigés, J. (1987) Aliphatic and aromatic hydrocarbons in different sized aerosols over the Mediterranean Sea: occurrence and origin. *Atmospheric Environment* **21**, 2247-2259.
- Simoneit, B.R.T. (1984) Organic matter of the troposphere-III. Characterization and sources of petroleum and pyrogenic residues in aerosols over the western United States. *Atmospheric Environment* **18**, 51-67.
- Simoneit, B.R.T. (1985) Application of molecular marker analysis to vehicular exhaust for source reconciliation. *International Journal of Environmental and Analytical Chemistry* **22**, 203-233.
- Simoneit, B.R.T. (1986) Characterization of organic constituents in aerosols in relation to their origin and transport: a review. *International Journal of Environmental and Analytical Chemistry* **23**, 207-237.
- Simoneit, B.R.T., and Mazurek, M.A. (1982) Organic matter of the troposphere-II. Natural background of biogenic lipid matter in aerosols over the rural western United States. *Atmospheric Environment* **16**, 2139-2159.
- Simoneit, B.R.T., Cox, R.E., and Standley, L.J. (1988) Organic matter of the troposphere-IV. Lipids in Harmattan aerosols of Nigeria. *Atmospheric Environment* **22**, 983-1004.
- Simoneit, B.R.T., Sheng, G., Chen, X., Fu, J., Zhang, J., and Xu, Y. (1991) Molecular marker study of extractable organic matter in aerosols from urban areas of China. *Atmospheric Environment* **25A**, 2111-2129.
- Smith, D.J.T., Edelhofer, E.C., and Harrison, R.M. (1995) Polynuclear aromatic hydrocarbon concentrations in road dust and soil samples collected in the United Kingdom and Pakistan. *Environmental Technology* **16**, 45-53.



- Smith, D.J.T., Harrison, R.M., Luhana, L., Pio, C.A., Castro, L.M., Tariq, M.N., Hayat, S., and Quraishi, T. (1996) Concentrations of particulate airborne polycyclic aromatic hydrocarbons and metals collected in Lahore, Pakistan. *Atmospheric Environment* **30**, 4031-4040.
- Sosrowidjojo, I.B., Alexander, R., and Kagi, R.I. (1994) The biomarker composition of some crude oils from Sumatra. *Organic Geochemistry* **21**, 303-312.
- Spitzer, T. (1982) Clean-up of polynuclear aromatic hydrocarbons from air particulate matter on XAD-2. *Journal of Chromatography* **237**, 273-278.
- Spitzer, T. (1993) Selective clean-up for polynuclear aromatic compounds in airborne particles and soil. *Journal of Chromatography* **643**, 43-49.
- Spitzer, T., and Dannecker, W. (1983) Membrane filters as adsorbents for polynuclear aromatic hydrocarbons during high-volume sampling of air particulate matter. *Analytical Chemistry* **55**, 2226-2228.
- Spitzer, T., and Kuwatsuka, S. (1986) Simple method for the determination of polynuclear aromatic hydrocarbons in soil by clean-up on XAD-2. *Journal of Chromatography* **358**, 434-437.
- Spitzer, T., and Kuwatsuka, S. (1988) Simultaneous clean-up of nitroarenes and polycyclic aromatic ketones from soil and particulate matter on XAD-2. *Journal of Chromatography* **435**, 489-495.
- Spitzer, T., and Kuwatsuka, S. (1993) Residue levels of polynuclear aromatic compounds in urban surface soil from Japan. *Journal of Chromatography* **643**, 305-309.
- Standley, L.J., and Simoneit, B.R.T. (1987) Characterization of extractable plant wax, resin, and thermally matured components in smoke particles from prescribed burns. *Environmental Science and Technology* **21**, 163-169.
- Stephanou, E.G., and Stratigakis, N.E. (1993) Determination of anthropogenic and biogenic organic compounds on airborne particles: flash chromatographic fractionation and capillary gas chromatographic analysis. *Journal of Chromatography* **644**, 141-151.
- Sturaro, A., Parvoli, G., and Doretti, L. (1993) Plane tree bark as a passive sampler of polycyclic aromatic hydrocarbons in an urban environment. *Journal of Chromatography* **643**, 435-438.
- Summons, R.E., and Walter, M.R. (1990) Molecular fossils and microfossils of prokaryotes and protists from proterozoic sediments. *American Journal of Science* **290A**, 212-244.
- Summons, R.E., Powell, T.G., and Boreham, C.J. (1988) Petroleum geology and geochemistry of the Middle Proterozoic McArthur basin, Northern Australia: III. Composition of extractable hydrocarbons. *Geochimica et Cosmochimica Acta* **52**, 1747-1763.

- Sun, F., Littlejohn, D., and Gibson, M.D. (1998) Ultrasonication extraction and solid phase extraction clean-up for determination of US EPA 16 priority pollutant polycyclic aromatic hydrocarbons in soils by reversed-phase liquid chromatography with ultraviolet absorption detection. *Analytica Chimica Acta* **364**, 1-11.
- Sverdrup, G.M., Buxton, B.E., Chuang, J.C., and Casuccio, G.S. (1990) Determination of optimal storage conditions for particle samples. *Environmental Science and Technology* **24**, 1186-1195.
- Takada, H., Onda, T., and Ogura, N. (1990) Determination of polycyclic aromatic hydrocarbons in urban street dusts and their source materials by capillary gas chromatography. *Environmental Science and Technology* **24**, 1179-1186.
- Tang, H., Lewis, E.A., Eatough, D.J., Burton, R.M., and Farber, R.J. (1994) Determination of the particle size distribution and chemical composition of semi-volatile organic compounds in atmospheric fine particles with a diffusion denuder sampling system. *Atmospheric Environment* **28**, 939-947.
- Tornabene, T.G., and Langworthy, T.A. (1978) Diphytanyl and dibiphytanyl glycerol ether lipids of methanogenic archaeobacteria. *Science* **203**, 51-53.
- Tulloch, A.P. (1976) Chemistry of waxes of higher plants. In: *Chemistry and Biochemistry of Natural Waxes* (Kolattukudy, P.E., editor) Elsevier, Amsterdam, p. 235-287.
- Turunen, M., and Huttunen, S. (1991) Effect of simulated acid rain on the epicuticular wax of Scots pine needles under northerly conditions. *Canadian Journal of Botany* **69**, 412-419.
- Van Vaeck, L., Van Cauwenberghe, K., and Janssens, J. (1984) The gas-particle distribution of organic aerosol constituents: measurement of the volatilisation artefact in hi-vol cascade impactor sampling. *Atmospheric Environment* **18**, 417-430.
- Venkataraman, C., and Friedlander, S.K. (1994) Size distributions of polycyclic aromatic hydrocarbons and elemental carbon. 2. Ambient measurements and effects of atmospheric processes. *Environmental Science and Technology* **28**, 563-572.
- Venkataraman, C., Lyons, J.M., and Friedlander, S.K. (1994) Size distributions of polycyclic aromatic hydrocarbons and elemental carbon. 1. Sampling, measurement methods, and source characterization. *Environmental Science and Technology* **28**, 555-562.
- Volkman, J.K., Gillan, F.T., Johns, R.B., and Eglinton, G. (1981) Sources of neutral lipids in a temperate intertidal sediment. *Geochimica et Cosmochimica Acta* **45**, 1817-1828.
- Weete, J.D. (1976) Algal and fungal waxes. In: *Chemistry and Biochemistry of Natural Waxes* (Kolattukudy, P.E., editor) Elsevier, Amsterdam, p. 349-418.

- Welch, D.I., and Watts, C.D. (1990) Collection and identification of trace organic compounds in atmospheric deposition from a semi-rural site in the U.K. *International Journal of Environmental and Analytical Chemistry* **38**, 185-198.
- Westerholm, R., Stenberg, U., and Alsberg, T. (1988) Some aspects of the distribution of polycyclic aromatic hydrocarbons (PAH) between particles and gas phase from diluted gasoline exhausts generated with the use of a dilution tunnel, and its validity for measurement in ambient air. *Atmospheric Environment* **22**, 1005-1010.
- Wise, S.A., Benner, B.A., Chesler, S.N., Hilpert, L.R., Vogt, C.R., and May, W.E. (1986) Characterization of the polycyclic aromatic hydrocarbons from two standard reference material air particulate samples. *Analytical Chemistry* **58**, 3067-3077.
- Wise, S.A., Sander, L.C., and May, W.E. (1993) Determination of polycyclic aromatic hydrocarbons by liquid chromatography. *Journal of Chromatography* **642**, 329-349.
- Yamasaki, H., Kuwata, K., and Miyamoto, H. (1982) Effects of ambient temperature on aspects of airborne polycyclic aromatic hydrocarbons. *Environmental Science and Technology* **16**, 189-194.
- Yang, Y., and Baumann, W. (1995) Seasonal and areal variations of polycyclic aromatic hydrocarbon concentrations in street dust determined by supercritical fluid extraction and gas chromatography-mass spectrometry. *Analyst* **120**, 243-248.
- Zakaria, M.B., Horinouchi, A., Tsutsumi, S., Takada, H., Tanabe, S., and Ismail, A. (2000) Oil pollution in the straits of Malacca, Malaysia: application of molecular markers for source identification. *Environmental Science and Technology* **34**, 1189-1196.
- Zander, M. (1980) Polycyclic aromatic and heteroaromatic hydrocarbons. In: *The Handbook of Environmental Chemistry (Anthropogenic Compounds)* Vol. 3, Part A (Hutzinger, Ö., editor) Springer-Verlag, Berlin, p. 109-131.
- Zhang, X., and McMurry, P.H. (1991) Theoretical analysis of evaporative losses of adsorbed or absorbed species during atmospheric aerosol sampling. *Environmental Science and Technology* **25**, 456-459.
- Zheng, M., Wan, T.S.M., Fang, M., and Wang, F. (1997) Characterization of the non-volatile organic compounds in the aerosols of Hong Kong- Identification, abundance and origin. *Atmospheric Environment* **31**, 227-237.
- Zheng, M., Fang, M., Wang, F., and To, K.L. (2000) Characterization of the solvent extractable organic compounds in PM<sub>2.5</sub> aerosols in Hong Kong. *Atmospheric Environment* **34**, 2691-2702.