

(dimethylsiloxane) fiber into the sample for 2 h. The fiber is then inserted into a modified electrophoresis capillary column. Methanol desorbs the PAH, and electrophoretic analysis is done by using a borate buffer with cyclodextrins. The technique allows the analysis of the 16 EPA priority pollutant PAHs in 15 min with detection limits in the part-per-billion range and a variability of less than 7%. (*Anal. Chem.* **1997**, 69, 1726–31)

## PM methods comparison

Concerns about the health effects of ambient particulate matter has focused attention on PM measurement technology. G. Allen and colleagues reported comparisons of two EPA-approved methods: the Tapered Element Oscillating MicroBalance (TEOM) and the Federal Reference Method (FRM). FRM equilibrates on a filter at 15–30 °C, and TEOM collects particulates on a filter at 50 °C. Elevated temperature can lead to losses of semivolatile constituents and therefore reduces the apparent PM measurement. Although there was general agreement between procedures, because semivolatile losses are site- and time-dependent, it is difficult to apply corrective factors. In addition, semivolatile constituents are more prevalent in the fine fraction, leading to greater differences for PM<sub>2.5</sub> than for PM<sub>10</sub>. (*J. Air Waste Manage. Assoc.* **1997**, 47, 682–89)

## Immunosensor development

Immunoassays and biosensors have gained acceptance as analytical tools because of selectivity, sensitivity, and other advantages. O. A. Sadik and J. M. Van Emon concluded that combining these techniques to produce environmental immunosensors could lead to improvements in monitoring. Electrochemical, optical, or piezoelectric sensors with attached antibodies respond specifically to compounds such as atrazine or PCBs. Immuno-electrodes for PCBs have detection limits around 1 µg/L and a linear range to 100 µg/L. Long-term stability of the sensors remains an issue, with current shelf-lives of several months. Like enzyme-based biosensors, immunosensors will be used for rapid field screening. (*CHEMTECH*, **1997**, 27, 38–46)

## MODELING

### Allocating PAH sources

When multiple sources contribute the same contaminants to a sample, allocating the relative amount of contamination from each source can be difficult. W. A. Burns and co-workers used a model based on principal components analysis (PCA) and least-squares analysis to perform this allocation. They used it to analyze the PAHs present in sediments affected by the *Exxon Valdez* oil spill. With PCA they compared 36 PAHs produced by 30 different sources with 954 sediment samples. They found that 18 of the sources contributed significantly to the sediment samples. These sources were then applied to the iterative least-squares matching procedure to allocate the proportion of the contamination in each sample to the different sources. (*Environ. Toxicol. Chem.* **1997**, 16, 1119–31)

### Interflow water movement

Surface covers of gravel or geotextiles are being evaluated as a remediation option for contaminated sites in dry locations. These covers isolate contaminated materials from the environment by reducing the movement of water from top to bottom. Such covers may not adequately impede the flow of lateral-interflow water movement within subsurface soils. B. P. Wilcox and D. D. Breshears evaluated the relative importance of interflow water movement relating to risk assessments in semi-arid environments. They applied a radionuclide exposure model, RESRAD, to a simulated landfill site using three interflow scenarios. Only the scenarios that took interflow into account demonstrated that radionuclides could contaminate groundwater. The authors conclude that ignoring interflow could render risk assessments inaccurate and adversely affect remediation strategies. (*Hum. Ecol. Risk Assess.* **1997**, 3, 187–203)

## REMEDIATION

### Solvent extraction

Solvent extraction is a remediation technology designed to remove haz-

ardous organic compounds from soils, sludges, and sediments. J. R. Meier and colleagues used plant and earthworm bioassays to determine whether solvent extraction could reduce toxicity of PCB-contaminated soil. The extraction resulted in a 90% decrease in PCBs to concentrations below the remediation goal. However, soil concentrations of 2-propanol increased because of the use of isopropanol as a solvent. There was no acute toxicity to earthworms with the extracted soil; however, this soil was phytotoxic to lettuce and oats, presumably because of elevated levels of 2-propanol. The authors note that removal of the contaminant of concern with solvent extraction does not necessarily eliminate soil toxicity. (*Environ. Toxicol. Chem.* **1997**, 16, 928–38)

## RISK

### Probabilistic assessments

Risk managers evaluating a probabilistic health risk from a hazardous waste site or some other potential threat must distinguish between acceptable and unacceptable risk distributions to a population. For many government agencies, risk management policy often is based on whether a hazardous waste site or chemical exposure poses a 95th percentile lifetime cancer risk at or below 1 in 100,000. K. G. Edelman and D. E. Burmaster investigated whether risk managers should use the arithmetic mean of the risk distribution in addition to the upper 95th percentile. They conclude that use of the arithmetic mean would improve probabilistic risk assessments. It would permit risk management decisions based on average and upper percentile distributions. (*Hum. Ecol. Risk Assess.* **1997**, 3, 223–34)

### Public perceptions

Policy decision makers need to recognize public perceptions of risks. The landmark work (the “psychometric paradigm”) of Slovic, Fischhoff, and Lichtenstein was instrumental in identifying public attitudes toward risk, but it did not distinguish between individual and aggregate perceptions other than expert versus lay perceptions. C. Maris and colleagues questioned 131 individuals about