AIR

Indoor air measurements

Improved measurement techniques are needed to understand the role of fungal growth in indoor air quality problems. Previous studies identified a strong relationship between home dampness (elevated humidity) and reported respiratory health effects, and the role of high humidity in promoting fungal growth has received the most attention. J. D. Miller and J. C. Young describe a method for measuring ergosterol in indoor air and using it as an indicator of fungal exposure. Air sampling for ergosterol proved to be a reliable indicator of the total fungal biomass in air. The measurement does not provide any information on the species of fungi. (*Am. Ind. Hyg. Assoc. J.* **1997**, *58*, 39–43)

Mercury deposition trends

Many previous studies of atmospheric mercury deposition have documented increases in global deposition since the start of the Industrial Revolution, but there are little data on whether mercury levels have increased steadily or declined recently. D. R. Engstrom and E. B. Swain examined sediment cores from a suite of Minnesota lakes and remote wilderness sites in southeastern Alaska to assess recent changes in mercury deposition. Mercury deposition in the Minnesota lakes has declined since the 1960s. The declines coincide with reduced industrial use of mercury; increased removal of mercury from coal-fired power plants and smelters; decreased use of coal; and increased controls on waste incineration. In contrast, mercury deposition rates in southeastern Alaska are lower overall but have either remained steady or increased, a result that reflects global rather than regional trends. (*Environ. Sci. Technol.* **1997**, *31*, 960–67)

BIOTECHNOLOGY

Treating petroleum sludges

Biotreatment is a simple, low-cost technology for treating hydrocarbons in petroleum refinery sludges and contaminated refinery soils. M. D. Ferrari and co-workers evaluated biotreatment of hydrocarbons from petroleum tank bottom sludges using mixed soil slurries and compared it with solid-phase biotreatment. After 90 days, the slurries removed 47% of the total oil. Analysis indicated that 84% of saturates, 20% of aromatics, and 44% of the asphaltenes were removed. Resins increased 68%. Oil elimination did not improve with use of soil with fewer fine particles or with reinoculation with fresh bacterial cultures. Slurry-phase biotreatment showed less variability and faster oil removal than solid-phase biotreatment. (*Biotechnol. Lett.* **1996**, *18*, 1241–46)

Sources of lead in sediments

Water and sediments in Greece's Elfis Bay are severely polluted by lead from motor vehicles and industry in Athens. M. Kersten and colleagues studied lead sources and mobility with $^{206}Pb/^{207}Pb$ isotope ratios determined by ICPMS. Industrial activity accounted for 70–80% of sediment lead, whereas up to 70% of dissolved lead was derived from leaded gasoline. Some of the dissolved lead was precipitated as sulfide in summer with minimal remobilization in winter. A lead flux of 2 μg cm^{-2} yr^{-1} into the sediments was estimated, suggesting that direct atmospheric deposition of gasoline-derived Pb is not a major pollution pathway to this bay. Nevertheless, the authors propose stricter leaded gasoline regulations in Greece. (*Environ. Sci. Technol.*, this issue, pp. 1295–1301)

Removing copper from wastewater

Better treatment methods are needed to comply with EPA regulations for removing copper ions from aqueous solutions. J. Chen and colleagues report on the uptake of Cu(II) by calcium alginate beads under various experimental conditions (pH, ionic strength, concentration of reactants) in polluted waters. An initial, rapid process (~1 h) occurred, followed by a slower process (~15 h). The uptake rate by the biopolymer increased with increased pH and with decreased ionic strength and Cu concentration. An intraparticle diffusion model, combined with surface complexation, described the effects of pH on equilibrium and Cu uptake. The authors propose calcium alginate beads as an effective technology for removing Cu ions from wastewaters. (*Environ. Sci. Technol.*, this issue, pp. 1433–39)

No-clog bioreactors

Trickle-bed reactors have advantages over biofilters for removing toluene and other organic compounds from waste gases. However, reactor performance may decline because of clogging from excessive formation of biomass. F. J. Weber and S. Hartmans reported that limiting the amount of nutrients available for growth can prevent reactor clogging. Nutrient limitation in their semi-pilot-scale bioreactor resulted in a reduced toluene removal rate. But inoculation of the reactor with a fungal culture increased the rate, even under conditions of limited nutrients. They reported an average removal rate of 27 g C/(m^3h) during a 375-day period. The authors also evaluated use of a NaOH wash to remove excessive biomass. Toluene removal rates averaged 35 g C/(m^3h), and there was no net increase in biomass after 50 days. (*Biotechnol. Bioeng.* **1996**, *50*, 91–97)

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