Fail Path

Science

Electrodes give one-hour mutagenicity test

As little as 1.6 μg per mL of mutagen is detected in only one hour by a microbial sensor devised by Isao Karube and coworkers at Tokyo Institute of Technology [*Anal. Chem.*, **53**, 1024 (1981)]. They couple acetylcellulose membranes containing immobilized *Bacillus subtilis*, deficient in ability to repair DNA, to oxygen electrodes and measure current produced by bacterial respiration in oxygen-saturated glucose solutions. Added mutagens damage DNA, causing cell death, cessation of respiration, and rises in current. The sensors may lead to rapid screening of compounds for mutagenesis and continuous monitoring of environmental mutagens. Further work in Tokyo includes incorporation of rat liver microsomes into the sensors to simulate metabolic activation of mutagens.

Love Canal has not increased cancer rates

The incidence of cancer in the Love Canal area of Niagra Falls is not higher than that for the entire state of New York outside of New York City, says the New York State Department of Health [*Science*, **212**, 1404 (1981)]. Using data from the New York Cancer Registry for the period from 1955 to 1977, the department looked particularly at rates for liver cancer, lymphoma, and leukemia and found none of these consistently elevated. Of other types of cancer investigated, only respiratory cancer was higher than normal for residents near Love Canal, but this rate appears to be high for the entire city of Niagara Falls and does not appear to be associated with the toxic wastes buried at the dump site.

Titania glass may be cheap photocatalyst

Titanium oxide can be formed inexpensively into a monolithic titania glass that will catalyze the formation of hydrogen gas from water in sunlight, according to Edward A. Speers and associates at the University of Manitoba, Winnipeg [*Nature*, **291**, 399 (1981)]. Although the rate of hydrogen production is slow (about 6 micromoles per hour, and about twice that rate for glass first treated with a base such as potassium hydroxide), the glass is inexpensive to make and does not contain any precious metals, such as platinum or ruthenium, which are necessary for many other photocatalysts, the researchers say. Addition of cuprous ion to the glass increases hydrogen production by an order of magnitude, they find, although the reason for this enhancement is not clear.

Memory okay in workers exposed to PBB's

A study of the learning and memory skills of 25 chemical manufacturing workers who worked with polybrominated biphenyls (PBB's) shows no evidence of memory dysfunction [*Science*, **212**, 1413 (1981)]. Psychiatrist Gregory G. Brown of Henry Ford Hospital in Detroit and his associates previously had tested 21 Michigan farm residents exposed in 1973 to PBB's accidently mixed into animal feed. This group had complained of medical problems after their PBB exposure and scored poorly on short-term memory tests. The chemical workers had a higher average concentration of PBB's in their adipose tissue than the farm workers but did not show a loss of memory. Thus, the researchers conclude, the memory loss of some Michigan residents exposed to PBB's may be related to their anxiety over that exposure.

Education

ASEE tackles engineering faculty shortages

The American Society for Engineering Education hopes to have a staff executive in place by August working on the problem of the growing engineering faculty shortage in the U.S. Funding is being supplied by AT&T, Du Pont, Exxon, General Electric, General Motors, GTE, IBM, and Union Carbide. The grant for the new position and accompanying activities—funded at about $100,000 a year—actually will be made to ASEE through the American Association of Engineering Societies—to ensure, ASEE says, that the effort has the support of the entire profession. ASEE has begun active recruiting for the position. The person will have four major responsibilities: to bring together relevant data on the problem, ensuring an accurate and adequate data base; to develop, with industry, a viable plan of action to solve the faculty problem; to work with industry, government, and universities to implement the plan; and to coordinate the activities of other industrial and association efforts toward solving the problem. Industry's demand for engineers has placed tremendous strains on engineering schools, with a conservative estimate putting the faculty shortage at 2000 nationwide.

Technology

GM tests coal-fueled automobiles

Turbine engines fueled by powdered coal have been installed and tested in 1981 models of a Camag El Dorado and an Oldsmobile by General Motors. GM engineers say turbine power is comparable to that of a small V-8 engine but weighs much less. Driver and passengers notice no difference driving gasoline- or coal-fueled cars. Compressed air from an engine-driven compressor pumps powdered coal from a tank above the right front wheel to the engine. Vibrators in the tank assure smooth flow of coal powder. A computer in the car controls combustion. An electric spark ignites a small amount of liquid fuel to start the engine, which runs on coal after that. Coal storage, pumping, and injection still need development, GM says, and particulate, smoke, and nitrogen oxide emissions need further effort to bring them to acceptable levels. Carbon monoxide and hydrocarbons emissions are comparable to those from a gasoline-fueled car, however.

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