CHEMECOLOGY

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Vinyl Chloride Plant Emissions Cut to 10 ppm to Protect Public

Tight limits on air emissions of vinyl chloride from plants manufacturing or using the material have been proposed by the Environmental Protection Agency to protect the general public from exposure. Vinyl chloride is a gas used to make polyvinyl chloride, a thermoplastic resin. The gas has been associated with angiosarcoma, a rare and fatal form of liver cancer, among some workers exposed to it over long periods.

EPA says vinyl chloride also can cause other types of cancers and non-cancerous disorders in humans without occupational exposure.

The proposed standard would require installation of best available control technology to reduce emissions to 10 parts per million from point and fugitive emission sources in each plant. The move is expected to reduce vinyl chloride more than 90 percent from uncontrolled levels.

The rules, published in the December 19 *Federal Register*, are aimed at all existing and new plants that manufacture ethylene dichloride (by the oxy-chlorination process), vinyl chloride or polyvinyl chloride. There are 17 ethylene dichloride-vinyl chloride plants in the United States and 41 polyvinyl chloride plants.

EPA says incinerators, solvent ab-

(Continued on page two)

EPA Curbs PCBs, Moves Towards Ban

The Environmental Protection Agency is moving toward totally eliminating the use of polychlorinated biphenyls on grounds that the industrial compound is a serious threat to human health and the environment.

PCBs have been in use for 45 years in a variety of commercial and industrial applications. Because they do not readily degrade, their use was voluntarily restricted to closed systems in 1972 by Monsanto Company, the sole U.S. manufacturer.

Since then, PCBs have been used mainly as insulating fluids in electrical transformers and capacitors where their stable, fire-resistant properties are essential for safety (see page two).

EPA says the large amounts of PCBs that have entered the environment are building up excessively in aquatic life, threatening commercial fishing in the Hudson River, the upper Mississippi River, the Great Lakes and along the Southern California coast.

The agency is taking these steps:

- EPA regional offices will establish requirements under the Water Pollution Control Act to virtually eliminate PCBs from process wastes of the manufacturer of the compound and those using it in capacitors and transformers.
- The manufacturer and users of PCBs are urged to develop environmentally acceptable alternatives as soon as possible.
- The agency has scheduled several meetings in January with industry leaders to ask their support in controlling PCBs.

Professor Searching for New Angle on Fluorocarbon Sources



Joseph Kraenec, project leader (left), and Dr. R. A. Rasmussen, principal investigator, introduce samples of air sealed in a ship stanchion since 1944 into a gas chromatograph with an electron capture detector.

Name any item from automobiles to zithers that's been around awhile and undoubtedly you'll find plenty of antique buffs who have collections. But a gentleman on the West Coast has an interest that has to be unique. It's antique air.

Dr. R. A. Rasmussen of Washington State University doesn't collect old air as a hobby, however. He's doing it in the name of environmental science.

Dr. Rasmussen is examining old air to determine whether chlorofluorocarbons (commonly called fluorocarbons) existed in the atmosphere before their commercial introduction in the early 1930s. At present, it is assumed that all fluorocarbons are man-made. Unfortunately, systematic atmospheric measurements for fluorocarbons were not made until 1970. Therefore, the level at which fluorocarbons may have been present in the earth's atmosphere prior to their manufacture is uncertain.

If the compounds were present before 1930, however, it would force a reexamination of current thinking about the impact of commercial fluorocarbons on the ozone layer. It also would raise the possibility of the existence of natural sinks for the compounds, a phenomenon that remains as of yet unidentified.

Even obtaining a history of fluorocarbon concentrations in air between 1930 to 1970 will help to better calculate the rate of transport of fluorocarbons to the stratosphere and their rate of global dispersion within the troposphere.

The research is one of many projects the fluorocarbon industry is sponsoring to determine the possible impact of fluorocarbons on the ozone layer.

Dr. Rasmussen is presently analyzing a number of antique air samples that have been impounded under conditions that rule out contamination by ambient air from a later period. They are taken from sealed sources such as vessels in museums, antique hour glasses, old sea buoys—even the stanchions of naval ships.

Other containers being considered as possible sources of "pure" antique air are time capsules retrieved during the bicentennial year, sealed urns of cremation ashes and containers held by historical societies. *(Continued on page two)*

MONS 031829

Dow Develops PCB Substitute For Insulators

A new insulating fluid which could become an environmental alternative for polychlorinated biphenyls in some electrical equipment applications has been developed by The Dow Chemical Company and tested by the McGraw-Edison Company. In a joint announcement, the companies said the insulating fluid can be used in place of PCBs in high-voltage power capacitors.

In the late 1960s, PCBs were identified as hazardous to man and his environment because the toxic material is not readily biodegradable. In 1970, PCB sales were voluntarily limited to closed systems, such as power capacitors, by the sole U.S. manufacturer, Monsanto Company.

Despite such safeguards, some 1,000 pounds of PCBs are lost to the environment each year, according to the estimate of a Monsanto spokesman. Until now, more ecologically acceptable substitutes for them in electrical systems have not been used because they are highly flammable.

The new fluid is an alkylated chlordiphenyl oxido. According to its developers, it performs electrically as well or better than PCBs.

At the same time, they claim that health and environmental characteristics are "significantly superior to PCBs." Selected from a variety of chemicals tested to fill this role, the new fluid is said to be highly biodegradable compared with PCBs, less toxic to wildlife and less bioaccumulative in animals.

Dow says it will make the new insulating fluid commercially available early in 1976. McGraw-Edison plans to begin using it in capacitors in commercial quantities by mid-1976.

New Primary Drinking Water Standards To Limit Some Inorganics, Pesticides

Regulations that place uniform minimum standards on contaminants in public drinking water supplies have been set by the Environmental Protection Agency. They become effective in June 1977.

The standards set maximum contaminant levels for bacteria, turbidity, 10 inorganic chemicals (see box) and six pesticides that have been detected in drinking water. They also prescribe minimum monitoring frequencies for water supply systems.

The agency also has started a special monitoring program to get needed information on organic chemicals in drinking water. Monitoring will be conducted in about 100 communities during 1976.

NATIONAL INTERIM PRIMARY DRINKING WATER STANDARDS

Maximum Contaminant Levels for Inorganic Chemicals

Contaminant	Level (mg/1)
arsenic	0.05
barium	1.
cadmium	0.010
chromium	0.05
lead	0.05
mercury	0.002
nitrate	10.
selenium	0.01
silver	0.05

Fluorides

When the annual average of the maximum daily air temperatures for the location in which the community water system is situated is the following, the corresponding concentration of fluoride shall not be exceeded:

Temperature (in degrees F)	(in degrees C)	Level (mg/1)
53.7 and below	12.0 and below	2.4
53.8-58.3	12.1-14.6	2.2
58.4-63.8	14.7-17.6	2.0
63.9-70.6	17.7-21.4	1.8
70.7-79.2	21.5-26.2	1.6
79.3-90.5	26.3-32.5	1.4

Maximum Contaminant Levels for Organic Pesticides

Chlorinated Hydrocarbons	Level (mg/1)
endrin	0.0002
lindane	0.004
methoxychlor	0.1
toxaphene	0.005
Chlorophenoxys	
2,4-D	0.1
2,4,5-TP Silvex	0.01

Compounds EPA will look for in the monitoring program are halogenated and aromatic organics. Additional studies will be performed on aromatic amines and nitrosamines.

EPA Administrator Russell Train said the interim primary regulations are the first step in carrying out the Safe Drinking Water Act of 1974. "That process," he said, "involved the setting of interim standards as soon as possible and the initiation of an intensive study of contaminant effects by the National Academy of Sciences."

The NAS study, due the end of this year, will provide more information needed to revise the interim standards.

Due to insufficient information, the present regulations do not contain a general standard to limit organic chemicals. Some of the materials have been detected in very low concentrations in some public water supplies.

Mr. Train said EPA is concerned about possible adverse health effects of these contaminants, and that the agency intends to establish these standards as the information is available.

EPA is undertaking a $5 million research effort this year directed toward identifying the sources, distribution, treatment techniques and health effects of a variety of organic chemicals.

EPA estimates that the total capital investment required for water systems to comply with these regulations will be $1.1 to $1.8 billion, phased over a five-year period.

Vinyl Chloride Emissions *(Continued from page one)*

sorbers, carbon absorbers and process changes can control point source emissions. Fugitive emissions from in-plant processes can be controlled, EPA says, by enclosing the sources capturing the emissions and venting them to a control device.

Because the agency believes vinyl chloride in process wastewater may escape to the atmosphere, the proposed standard treats such wastewater as a fugitive emission source subject to the 10-ppm limit.

Plants will have to meet the proposed standard within 90 days after final promulgation, expected early this spring. Extensions of up to two years could be granted by the EPA administrator if he finds that the time is needed to install the controls.

EPA estimates that it will cost existing plants $198 million to install control equipment and $70 million annually to maintain the required emission levels.

The proposed restriction of vinyl chloride emissions is made under the hazardous air pollutant section of the Clean Air Act. Asbestos, beryllium and mercury were curtailed in the same way on April 6, 1973.

EPA has scheduled public hearings on the proposed standard for February 3 and 4 in Washington.

Anyone interested in commenting on the proposal should submit three copies to Don R. Goodwin, Emission Standards and Engineering Division, EPA, Research Triangle Park, N.C. 27711.

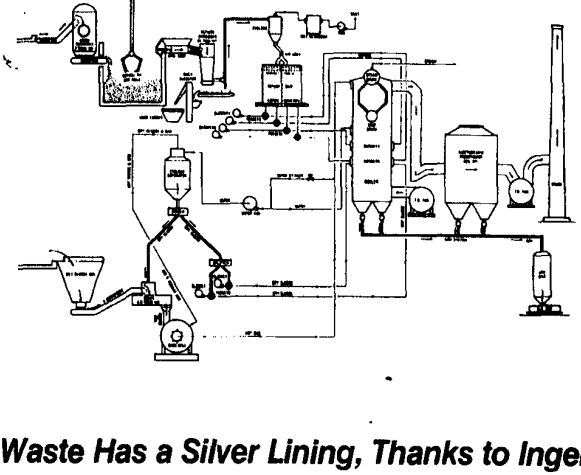
Fluorocarbon Sources

(Continued from page one)

One of the promising candidates, however, is the air in the bellows of aneroid barometers. These, Dr. Rasmussen says, "would provide the needed replications of a statistical population, a variety of known locations of manufacture and accurate dates of the captured air."

If you have a barometer or other uncontaminated sample of vintage air you'd like to volunteer, contact Dr. R. A. Rasmussen, professor, Atmospheric Resources Section, Washington State University, Pullman, Washington 99163.

MONS 031830



Case History

Kodak's Waste Has a Silver Lining, Thanks to Ingenuity

Problem: Eight years ago, the Eastman Kodak Company began looking for a combustion system to dispose of the tons of plant trash and wastewater sludge generated daily at its manufacturing complex in Rochester, N.Y. But at that time, the state of the art for such a device was comparatively primitive.

Undaunted, Kodak engineers worked with outside consultants to fashion equipment to fit their needs. The end result is a unit that does a lot more than incinerate wastes. It also reclaims heat, produces steam and recovers silver to help offset its $10 million price tag.

Action: After considerable experimentation, Kodak evolved a waste disposer involving three operations:

- A refuse section, which includes a shredder, can break up daily as much as 180 tons of paper, packaging wastes and general plant trash.
- A sludge-drying section uses heat from its own operations to flash-dry sludge from the company's wastewater treatment plant for burning as part of the system's fuel source.
- A combustion section generates steam for plant operations by burning the refuse and sludge in a suspension-fired boiler.

In operation, refuse from various Kodak plants is brought to a pit with a 380-ton storage capacity. The waste is fed by crane to a conveyor, which moves it into the shredder.

The waste is chewed into 50-cent-sized chunks and discharged into a pneumatic conveyor. Heavy items such as metals, some plastic and wood are separated out by gravity, while lighter material is blown upwards into a storage silo.

From there, waste is pneumatically conveyed into the four corners of a ten-foot-square combustion chamber through ports a third of the way up the chamber's 60-foot walls.

Sludge is dumped into a separate storage bin. A screw-type system transports it to a belt conveyor, which takes it into the flash dryer. Inside, the new sludge is mixed with previously dried sludge to form a substance with a moisture content of about 60 percent. This falls into a mill, where 1,000-degree flue gases from the boiler flash off all but 15 percent of the moisture.

The flue gas is returned to the boiler for burning. The nearly-dry sludge is mechanically separated. Some 90 percent returns to the mixer to be recycled into the conditioning step. The rest is fed into the boiler.

Both the sludge and light trash are blown into the center of the boiler to obtain complete combustion. This is stabilized by adding No. 6 fuel oil to the mixture. Heat-absorbing watertubes are arrayed around the firewall for steam generation.

Kodak engineers had to overcome some major obstacles in bringing the system onstream. For example, belts couldn't take the refuse away from the shredder fast enough. And the dust generated there was more than expected. A pneumatic conveyor solved both problems.

The storage silo was another challenge. Waste falling into it would build into layers and compact, necessitating a row of augers to break up the material.

Results: Having overcome most of its technical problems, the unit began operating in 1974 and went into full service last summer. Kodak says the disposer meets strict federal standards for controlling air pollution emissions.

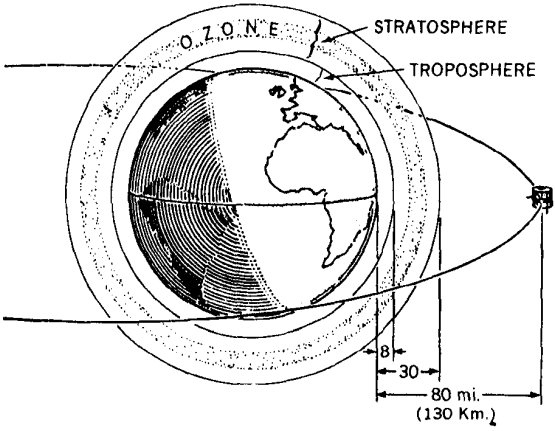
The combustion unit is where the system really begins to help pay for itself. Approximately 77,000 pounds of steam are produced each hour. It is converted into electricity to power plant processes.

A more valuable by-product, however, is the bottom ash from the boiler and the fly ash collected by electrostatic precipitators to prevent air pollution. These ashes contain silver residues from film manufacturing.

Thirty tons of ashes are collected daily, loaded onto railroad gondola cars and sent to a company in Canada which recovers the silver.

Another advantage of the combustible disposer is that it reduces the waste load to manageable proportions. The ashes—about three percent of the original bulk—are landfilled.

MONS 031831



This satellite will dip out of orbit to measure ozone concentrations in the stratosphere.

'Dippy' Satellite To Measure Ozone

A satellite with a "dippy" flight pattern has just gone on station to conduct tests in the upper atmosphere, among them a check on the earth's protective ozone layer.

The National Aeronautics and Space Administration satellite can come 80 miles closer to the earth's surface than any other previously-orbited spacecraft before returning to space. The satellite's orbit will be lowered by radio control every two weeks, moving the craft close enough to measure the distribution of ozone on a global basis. This "dipping" should allow it to sample ozone located in a belt 20 to 30 miles above earth.

Dr. Donald Heath, a Goddard scientist heading the program, says measurements over a long period of time are necessary as ozone distribution naturally varies from time to time.

He believes this program, in conjunction with reports from earlier spacecraft and from future flights, should provide by 1980 an accurate picture of the health of the ozone layer.

Environmental Projects Help Counter Recession, CEQ Says

Environmental projects may have created more than one million jobs in the United States during 1975, making the pollution control industry one of the relatively few areas of job strength during the current recession.

Furthermore, growth in this field could open up several million additional jobs over the next decade as industry and municipalities implement pollution abatement programs that could cost as much as $200 billion.

The estimates on environmental employment were made public recently by Russell W. Peterson, chairman of the President's Council on Environmental Quality, at an environmental industry conference in Washington.

The figures are from a new CEQ study analyzing the development and prospects of some 600 firms that manufacture and market pollution control equipment.

The current employment level is based on a government estimate that each billion dollars of federal expenditures for pollution control generates 70,000 jobs.

Thus, the study concludes, the $15.7 billion spent on environmental programs in 1975 by public and private sectors should have opened more than one million jobs.

On the other hand, the study claims that fears of widespread unemployment from pollution-related plant closings have not been realized.

The Environmental Protection Agency has an early warning system to monitor threatened and actual plant closings. Since 1971, EPA has counted 75 plant closings affecting some 15,700 jobs. This is roughly sixteen-thousandths of one percent of the labor force.

Even in those instances, the study says that environmental regulations sometimes were only one consideration in closing marginally productive, older plants that were on the brink of being phased out.

CEQ Chairman Peterson said the United States has made the most extensive advances in developing pollution control equipment and has a competitive edge in supplying such hardware overseas.

The Department of Commerce, he said, is preparing a study which projects a multi-billion dollar export market for pollution control devices within a few years.

Workshops to Determine Standards Needed To Gauge Pollution from Energy Projects

A series of workshops aimed at determining what kinds of standards may be needed for measuring environmental pollution associated with energy production will be held during the next six months by the National Bureau of Standards and the Environmental Protection Agency.

Beginning in January, workshops will be held at the National Bureau of Standards in Gaithersburg, Md., to determine how many and what kinds of Standard Reference Materials NBS should develop to assist EPA in measuring water and air pollution that may result from various types of energy production.

SRM's are materials whose chemical composition or particular chemical or physical properties have been accurately determined and certified. More than 900 NBS SRM's are currently available and are used throughout industry and the scientific community to calibrate and evaluate measurement instruments and test methods.

The workshop schedule is:

Jan. 20, 21—Coal Gasification and Liquefaction
Feb. 3, 4—Coal Desulfurization
Feb. 19, 20—Power Plant Operation
Mar. 22, 23—Uranium Mining
Apr. 28, 29—Mine Drainage
May 24, 25—Geothermal Energy Utilization

Attendance at the workshops is by invitation only. For information, contact Donald Becker, Analytical Chemistry Division, Chemistry Building A309, Washington, D.C. 20234.

MONS 031832



This stripping column will reduce vinyl chloride emissions to the atmosphere.

Goodrich VC Containment Program Greatly Reduces Worker Exposure

Two years after identifying vinyl chloride as the probable cause of a rare occupational disease, The B. F. Goodrich Company says new technology enables it to comply with federal regulations governing exposure to the gas while expanding production of the material.

At a year-end press conference, Goodrich President John D. Ong said the firm has implemented the results of a massive research program with a capital outlay of $42 million from 1974 through 1977 aimed at eliminating the workplace health hazard.

Goodrich operates one plant that produces vinyl chloride monomer and five plants that transform the gas into polyvinyl chloride, the second largest-selling plastic in the United States.

"We now believe that the chances are extremely remote of future angiosarcoma cases resulting from vinyl chloride exposure in our current operations," Mr. Ong said. Angiosarcoma is a rare form of liver cancer which has caused the deaths of about 40 workers in PVC polymerization plants around the world.

"However," Mr. Ong added, "we still face the possibility that, because of the long latency period, we will see other cases of angiosarcoma among workers who experienced exposures at high levels in the past."

He outlined these results of Goodrich's vinyl chloride containment programs.

- The company's PVC and vinyl chloride plants are operating at levels of one to three parts of vinyl chloride per million parts of air in work areas. These are average levels, and employee exposure as measured by personal monitoring is considerably lower. With the use of respiratory equipment when required, worker exposure is being kept below levels (one ppm over eight hours and five ppm during any 15-minute segment) required by the federal Occupational Safety and Health Administration.
- Vinyl chloride emissions to the atmosphere from Goodrich plants have been reduced to a few hundredths of one ppm at plant boundaries, and ambient levels become virtually non-detectable within a short distance from the plants.
- Goodrich can supply general-purpose PVC resins that are so low in entrapped vinyl cholide gas that the company believes processors using this material will not have to establish "regulated areas" in their plants. (OSHA regulations require establishment of regulated areas when average vinyl chloride levels in work atmospheres exceed 0.5 ppm.)

Goodrich also has a "clean reactor" system which, together with previous improvements, greatly reduces the frequency of polymerization reactor entry and cleaning. The new system will virtually eliminate employee exposure to vinyl chloride gas in cleaning procedures.

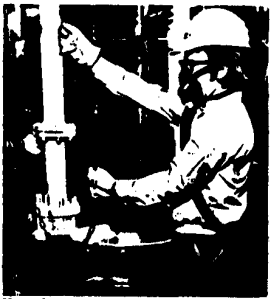
The new technology combines new processes with the use of materials for treating the interiors of new or used reactors to prevent the buildup of solid deposits, even after a number of charges.

"Our goal," said Mr. Ong, "is a completely closed, automated and essentially leak-proof reaction system that will require no reactor opening or entry except for periodic maintenance."

Mr. Ong also said the company is well on its way to completing installation of new stripping columns at all PVC plants. These columns, a Goodrich development, remove all but traces of vinyl chloride from PVC as it comes from reactors, reducing substantially the amount of this gas which might otherwise be emitted to the atmosphere.



A personal monitoring device shows workers are well within federal exposure limits.



Use of masks, where necessary, protects PVC workers from vinyl chloride monomer.

MONS 031833

OSHA Proposes Draft Standards on 23 Toxic Substances

Draft technical standards recommending occupational health practices for 23 toxic substances are now available for public inspection. They were prepared as part of a joint Standards Completion Project in which the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health are developing standards for 400 toxic materials.

Drafts of Set I of the proposed standards cover: acetylene tetrabromide, allyl chloride, chlorobenzene, chlorodiphenyl (54 percent chlorine), 1,1-dichloroethane, epichlorohydrine, 1,1,2,2-tetrachloro-1, 2-difluoroethane, 1,1,1,2-tetrachloro-2, 2-difluoroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane and trifluoromono-bromomethane.

Drafts of Set J of the proposed standards include: arsine, carbon tetrachloride, diazomethane, o-dichlorobenzene, diethylamine, dimethylamine, ethylene dichloride, methyl chloroform, tetrachloroethylene and 1,1,2-trichloroethane.

If adopted, the standards will establish requirements for monitoring employee exposure, medical surveillance, methods of compliance, handling and use of substances, employee training, recordkeeping, sanitation and housekeeping.

Occupational exposure limits are not at issue in the proposals and no changes from present levels are being recommended.

Copies of the draft technical standards can be inspected at OSHA headquarters in Washington or at its regional and area offices.

OSHA Names Advisors

Five new members have been named to the National Advisory Committee on Occupational Safety and Health. The committee was established by the Occupational Safety and Health Act of 1970 to make recommendations to the Secretary of Labor on a national job safety and health program.

The new members are Dr. Miles Colwell, vice president, health and environment, Aluminum Company of America; Dr. Paul Kotin, medical director, Johns-Manville Corporation; Edward N. Deck, manager, corporate safety and security, General Electric Company; Dr. May Amdur, department of physiology, Harvard School of Medicine and Dr. Harold R. Imbus, medical director, Burlington Industries.

Gosline Joins MCA Staff

Carl A. Gosline has recently been appointed to the technical staff of MCA by its president, William J. Driver. Mr. Gosline will be assistant technical director for air quality and water resources.

Before joining MCA, Mr. Gosline was executive vice president of Systems Associates, Inc., a firm specializing in environmental and water resource planning and management. Before that, he was president of Rollins Environmental Services, an industrial waste treatment company, and worked with the Du Pont Company in various capacities for 22 years.



C. A. Gosline

Mr. Gosline was a charter member of MCA's Air Quality Committee when it formed in 1949, representing Du Pont. He is the author of a number of environmental technical articles and edited an *Air Pollution Abatement Manual* for MCA.

He holds a bachelor's degree in zoology-chemistry from the University of Iowa.

Risks-Benefits Must Be Weighed to Resolve Occupational Health Problems, Finklea Says

If the complex series of occupational and environmental health problems facing us today are not solved, future generations will look back on this period as a "temporary golden age," says John Finklea, director, National Institute for Occupational Safety and Health.

In a recent speech before the American Public Health Association, Mr. Finklea said that a better system of making scientific judgments must be found and a new mechanism developed for obtaining timely data from industry on health hazards.

If the interaction of multiple agents is to be clearly understood, he continued, new social institutions for dealing with the interdependence of occupational and environmental health must be explored.

He believes risk-benefit policies are mandated in certain areas where scientific uncertainties cause many problems in establishing acceptable exposure limits for hazardous materials.

Major unresolved problems in occupational health cited by Finklea include needs for:

- More qualified manpower, services and training programs for both employers and employees;
- Closed systems to replace old work processes;
- A sensible risk policy for carcinogens, and
- A better definition of occupational and environmental illnesses.

Cyanamid to Control SO_2 With Double Absorption

American Cyanamid Company plans to build a $20 million sulfuric acid facility at Fortier, La., that will incorporate the latest pollution control equipment.

The plant, with a capacity of 530,000 tons per year, will use a double absorption process to control sulfur dioxide emissions. The system was first employed in the United States by Cyanamid in 1970 at a smaller sulfuric acid plant in Linden, N.J. Cyanamid added another modern sulfuric acid plant at its Savannah, Ga., complex earlier this year, using similar anti-pollution controls.

Construction of the Fortier plant will begin shortly, with completion scheduled for the second half of 1978.

Train Curtails Chlordane, Heptachlor

Environmental Protection Agency Administrator Russell Train has ordered a ban on most uses of the pesticides chlordane and heptachlor, claiming they pose an "immediate hazard" of cancer in humans.

In taking the action, Mr. Train overruled the agency's administrative law judge, Herbert L. Perlman. Evidence presented during a 43-day hearing recently convinced him that the pesticides are not an imminent cancer risk and should be allowed to stay on the market.

Judge Perlman found that although the compounds appear to be carcinogens in laboratory animals, there is not conclusive proof that they can cause cancer.

Mr. Train ordered 70 percent of chlordane and 85 percent of heptachlor off market shelves, leaving limited amounts available for underground termite applications and certain other controlled programs. Chlordane will be allowed on corn crops until August 1.

The ban will remain in force while EPA holds final cancellation hearings. Velsicol Chemical Corporation, sole manufacturer of the pesticides, has asked the U.S. District Court in Cincinnati to set aside the ban.

In a similar move, former EPA Administrator William Ruckelshaus overruled an administrative law judge in 1972 to stop the use of DDT.

MONS 031834



A man-made microbe designed to attack oil spills on waterways, digesting petroleum and converting it into a form that can be eaten by marine organisms, has been created by Dr. A. M. Chakrabarty of General Electric. The "super-microbe," still in the laboratory stage, combines the genetic makeup of four different strains of bacteria. Two flasks of oil and water are at right foreground. GE's microbes in the flask at right are beginning to digest the crude oil. Circular spots on the culture disk at left are colonies of the man-made microbes.

Conference to Discuss Transporting Hazardous Materials on Lake Superior

A conference on the long-range implications of transporting oil and other toxic and *hazardous substances on Lake Superior* will be held March 9-11 in Duluth. It is being sponsored by the Minnesota Pollution Control Agency.

The conference will explore the need for and alternatives to surface transport of such materials on Lake Superior; the *potential for accidents* and their impact on property; water quality and the ecosystem; measures to reduce accidents, the effectiveness of accident-prevention measures *and the costs of spill containment* and clean-up programs.

The conference is designed to develop scientific and technical information in advance of potential increased use of Lake Superior for transportation of toxic and hazardous materials.

For details, contact Stephanie Lemenowsky, Minnesota Pollution Control Agency, 1935 W. County Road B2, Roseville, Minn. 55113.

Are You One of Them?

Environmental activists—who are they and what are their numbers?

Opinion Research Corporation, a public pulse-taker, defines them as "people who have either contacted their elected officials on an environmental issue during the past year or who belong to any of the numerous environmental organizations."

Some 18 percent of the American public thus qualify as environmental activists, ORC finds.

Library

DESIGN OF ENVIRONMENTAL INFORMATION SYSTEMS

International opinion on the design of environmental *information systems covers measuring techniques*, frequency, parameters, storage and dissemination of information on air, water, solid wastes and the activities of international organizations. A copy is $24.50 from Ann Arbor Science Publishers, Inc., P.O. Box 1425, *Ann Arbor, Mich. 48106.*

OZONE CHEMISTRY AND TECHNOLOGY

This review of literature on ozone research, plus a bibliography, spans 1901 to 1974. Contributing authors are from chemical companies, universities and government research laboratories. Chapters include ozone chemistry and atmospheric chemistry. A copy is $30 if invoiced, $28 if accompanied by check, to The Franklin Institute Press, Benjamin Franklin Parkway, *Philadelphia, Pa. 19103*

RESOURCE RECOVERY AND RECYCLING HANDBOOK OF INDUSTRIAL WASTES

The conversion of industrial wastes to recovered resources is the focus of this book. Processing is considered in the light of currently available technology. Costs are not discussed. Examples are drawn from government projects and patent literature. There are chapters on fly ash, chlorides and sulfur, and on ferrous and nonferrous metals such as iron, steel, arsenic, beryllium, cadmium and aluminum. A copy is $36 from Noyes Data Corporation, Mill Road at Grand Ave., Park Ridge, N.J. 07656.

CRITICAL REVIEWS IN ENVIRONMENTAL CONTROL

This quarterly journal lists in abstracts what are judged the most significant environmental papers published. The reviewers are the editor of the journal and an independent authority named in each issue. To subscribe, send $56 to CRC Press, 18901 Cranwood Parkway, Cleveland, Ohio 44128.

RECYCLING OF PLASTICS FROM URBAN AND INDUSTRIAL REFUSE

The Bureau of Mines reports on methods for separating and reusing urban and industrial plastic wastes. Separation methods such as air classifications, jigging, liquid media, screening and electrostatics were studied. A sink-float-flotation process was used to differentiate between vinyl-based, polyolefin- and styrene plastics. The report, PB-237 837-DWP, is $3.75 from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

OCEAN WASTE DISPOSAL PRACTICES

The assimilative capacity of U.S. coastal waters is the major emphasis. Drawn from government reports on ocean dumping, the book uses scientific findings to project possible long-range effects. Chapters include defining ocean wastes, monitoring disposal, economic aspects and studies of the New York and Mid-Atlantic bight, plus other areas. A copy is $24 from Noyes Data Corporation.

BEHAVIORAL TOXICOLOGY

This is a report on the latest developments in the effects of environmental pollutants and drugs on the behavior and performance of humans, and lower animals. Among the topics: prenatal exposure of mice to methylmercury, effects of carbon monoxide and pesticides on behavior of living organisms, the uses of behavioral techniques on industrial toxicology and an appraisal of environmental contaminants. A copy is $39.50 from Plenum Publishing Corporation, 227 W. 17th St., New York, N.Y. 10011.

CAPABILITIES AND COSTS OF TECHNOLOGY FOR THE INORGANIC CHEMICALS INDUSTRY TO ACHIEVE THE EFFLUENT LIMITATIONS OF P.L. 92-500

Currently available or anticipated technologies necessary for the inorganic chemical industry to meet federal water pollution abatement requirements are reviewed with an eye on costs. PB-244 800-9WP is $12.50 from NTIS.

MONS 031835

Environmental Events

Solid Wastes Conference, January 19-21, Nashville, Tenn. Contact Tom Himes, University of Tennessee's Center for Government Training, 323 McLemore St., Nashville, Tenn. 37203.

Seminar on Resolving Corrosion Problems on Air Pollution Control Equipment, January 20-23, Atlanta, Ga. Contact National Association of Corrosion Engineers, 2400 W. Loop South, Houston, Tex. 77027.

Conference on Health and Environmental Effects of Energy Use, February 9-11, Washington, D.C. Contact Harold Bernard, Information Transfer, Inc., 1160 Rockville Pike, Rockville, Md. 20852.

Energy, Environment and the Economy, February 24-25, Washington, D.C. Contact National Environmental Development Association, 559 National Press Building, Washington, D.C. 20045.

Call for Papers for Conference on Environmental Measurement Standards, prior to March 1, Gaithersburg, Md. Contact Dr. James R. McNesby, Office of Air and Water Measurement, National Bureau of Standards, Chemistry Building, Washington, D.C. 20234.

Safe Transportation of Hazardous Materials Symposium, Feb. 9-10, Houston, Tex. Contact William H. Butterbaugh, MCA, 1825 Conn. Ave., N.W., Washington, D.C. 20009.

Society of Toxicology Annual Meeting, March 14-18 Atlanta, Ga. Contact Gale C. Boxill, Society of Toxicology, Wyeth Laboratories, Inc., Box 861, Paoli, Pa. 19301.

Convention of the National Association of Recycling Industries, March 18-23, San Francisco, Calif. Contact John R. McBride, NARI, 330 Madison Ave., New York, N.Y. 10017.

Development of Design Criteria for Wastewater Treatment Processes, March 28-April 2, Nashville, Tenn. Contact Prof. W. Wesley Eckenfelder, Jr., Vanderbilt University, Box 6222, Station B, Nashville, Tenn 37235.

Water Paper Available

The Environmental Protection Agency has published the 1975 edition of the Water Quality Strategy Paper, an annual document outlining policy and guidance in meeting the requirements of the Federal Water Pollution Control Act of 1972.

This year's edition summarizes near-term and long-term views of the agency on water pollution control, and charts EPA's goals for the current fiscal year.

Copies are available from the EPA Water Planning Division, Waterside Mall (WH415), Washington, D.C. 20460.

Rules Proposed for Hazardous Spills

Regulations designed to protect the nation's waterways from spills of hazardous substances have been proposed by the Environmental Protection Agency. The rules, the first of their kind, are called for by the 1972 Water Pollution Control Act Amendments.

The act requires EPA to publish a list of substances other than oil that would be hazardous to man or the environment when discharged into inland and coastal waters. More than 300 chemicals commonly used or produced by heavy industry are on the list.

Some of the materials that would be subject to the proposed regulations include: nitric and sulfuric acid, caustic soda, benzene, ammonia, chloroform, certain compounds of arsenic, antimony and mercury and others.

The proposals, published in the December 30 *Federal Register*, cover determination of the removability of substances from water and the amount of each substance that is considered harmful.

The new regulations propose fines up to $5 million for each illegal spill or discharge. However, EPA says, "any fine over $5,000 can only be assessed in cases where gross negligence is shown to be responsible for either the discharge itself or failure to take appropriate action afterwards to limit its harmful effects."

Penalties also may be imposed for failure to notify proper authorities when a spill occurs.

The regulations would apply to transportation tankers and fixed facilities.

Comments on the proposals should be sent in triplicate within 60 days to EPA's Hazardous Substances Branch, Office of Water Planning and Standards (WH-595), Washington, D.C. 20460.

Toxic Bill Advances

A House subcommittee has approved a strict toxic substances control bill and sent it to the Interstate and Foreign Commerce Committee. Markup of HR 10318 should begin late in January when Congress returns from its Christmas recess.

In backing the bill, the Consumer Protection Subcommittee turned down two other toxic control measures, HR 7229 and HR 7664. The Ford administration favored the more moderate HR 7664, saying it came closest to providing a balanced approach to controlling toxic substances.

James T. Lynn, director of the Office of Management and Budget, wrote to the subcommittee shortly before it voted on the issue. The administration, he said, favors legislation that will "provide for the control of toxic substances to the greatest extent possible through existing regulatory authority and requires that regulatory actions be aimed at the distribution and use of only those chemical substances found to pose an unreasonable risk to health or the environment."

Mr. Lynn said the bill should limit premarket notification "to only those chemicals that pose such an unreasonable risk rather than to all known chemicals."

MCA: What it is

Manufacturing Chemists Association is a non-profit trade association of United States and Canadian company members representing more than 90% of the production capacity of basic industrial chemicals within these countries. MCA is engaged in basic activities pertinent to the chemical industry, including matters related to environmental health. Activities are handled by MCA's staff and by committees composed of industry specialists who serve without compensation from the Association. MCA offices are at 1825 Connecticut Avenue, N.W., Washington, D.C. 20009.

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