

# chemistry

## AEROSOLS

### Death in a spray can

The search for chemical euphoria has led 36 young people to their deaths in the last two years, reports the University of Rochester. Inhaling the spray from aerosol cans is the cause, says Dr. Harold C. Hodge, chairman of the department of pharmacology. The culprit is a fluorocarbon gas, which is ordinarily not harmful, but because it is so compressed in the can, it is much more concentrated when released. Dr. Hodge regards the spray as more dangerous than the vapors from glue.

The most frequent cause of death is thought to be the disruption of the normal pumping action of the heart. This is caused by the gas making the heart more sensitive so that it reacts to the body's normal production of adrenalin by going into fibrillation, a rapid and disorganized beat that cannot move blood through the circulatory system.

Some of the 36 deaths may have come from freezing of the windpipe and subsequent constriction caused by pouring liquid fluorocarbon into the mouth, after the gas has condensed in a balloon used as an inhalator. The evaporation of the liquid and subsequent freezing blocked the windpipe.

Other gases, ranging from gasoline fumes to chloroform, also have a lethal effect in high concentration.

## FERTILIZERS

### Ice build-up prevented

The use of fertilizer to prevent ice and snow build-up at airports is spreading. Airports in the northern United States are joining with those in Canada to prevent ice and snow formation on runways and other areas with urea, a nitrogen-based fertilizer. The major drawback to the fertilizer is that it will not work in temperatures below 15 to 20 degrees F. or during severe snow storms.

It could be used to de-ice, but officials at Chicago O'Hare International Airport have found it better to prevent the ice build-up in the first place. The urea, in pellet form, reacts with moisture to generate enough heat to prevent ice and snow accumulation and does not corrode airplane metals and parts.

## OIL SLICKS

### No more Torrey Canyons

A chemical that offers a solution to destruction from oil spill incidents, such as the Torrey Canyon, has been successfully tested by the Cabot Corporation of Boston. The compound, whose chemical composition is the same as sand treated to make it waterproof, is nonflammable and has been around for five years; but no one thought to apply it to burn off oil slicks.

Called Cab-o-Sil ST-2-0, it works like millions of tiny nonflammable wicks, continually drawing up oil by capillary action from the surface layer of an oil mass so the oil can easily burn at the surface. Choppy seas should not hamper its effectiveness.

In a test it burned off 98 percent of hard-to-ignite crude oil. The remaining two percent becomes a rubbery mass easily scooped up.

## PURIFICATION

### Double attack on sewage

A two-pronged attack on bacterial contamination of waste water is being studied under an Atomic Energy Commission contract. Chemists at Atlantic Research in Alexandria, Va., are trying to determine the effectiveness of combined radioactive and chemical treatment of bacteria in sewage water.

First the effectiveness of isotopes in killing bacteria will be determined; then chemicals will be tested. Next the two will be combined to see if the effect is greatly increased by using the two together. If there is such a synergistic effect, the final step will be to determine the right combination of radioactivity and chemicals.

The radiation is not expected to pose a health problem because water is not affected by the process.

Ultimately, the purified water would be returned to a primary source, such as a river, stream or bay, and reused. This same result can be achieved by chemical means alone, but it is expensive and sometimes not adequately done.

## NUCLEAR WASTES

### Hydraulic fracturing tested

A two-year test has begun in western New York State for a method of radioactive liquid waste disposal. The method, called hydraulic fracturing, was developed and tested over the last 10 years at Oak Ridge National Laboratory in Tennessee. The test will use radioisotopes instead of actual radioactive wastes.

In hydraulic fracturing, liquid wastes mixed with liquid cement are forced out of a slot in a steel casing embedded in shale. The shale fractures, enabling the liquid to squeeze out and harden in a thin layer up to 1,000 feet long. The process is repeated at higher intervals.

The purpose of the test is to try out new variations of the technique and to see if it will work in shale formations in areas other than Oak Ridge.

## PESTICIDES

### Rubber to combat disease

Three health organizations are experimenting with rubber to kill water-borne disease carriers, such as the larvae of mosquitoes, flies, snails and flatworms. The U.S. Public Health Service, the World Health Organization and the Pan American Health Organization are testing a method developed by the B. F. Goodrich Company that permits the slow release of parasite-killing chemicals from rubber compounds into reservoirs, ponds and ditches.

Because the chemicals, organometallic and nitrogen-containing compounds, are only slightly soluble in water and are released slowly over long periods of time, they may pose no threat to humans, fish or cattle, say the Goodrich chemists.

The chemicals are considered superior to conventional pesticides, which are toxic to animals. Their greatest use is seen in underdeveloped areas.

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