

CHEMISTRY

Sun, Cerium Split Water

► WATER CAN be split into the two gases that compose it by merely dissolving in it compounds of the element cerium and setting the solution in sunlight.

This simple substitution for a task formerly needing an electric battery was described to the American Chemical Society meeting in Los Angeles by Drs. Lawrence J. Heidt and Alan F. McMillan of the Massachusetts Institute of Technology.

The green leaves of plants have until now held the secret of direct use of energy from sunlight. A number of chemical processes, such as the darkening of silver salts which makes photography possible, also make use of the sun's energy, but the process is not reversible.

In the new application to the compounds of cerium Drs. Heidt and McMillan have applied the sun's energy to start a chemical seesaw. Each stroke of this seesaw's double action throws out one of the gases which, when combined, form water.

Cerium is one of the more abundant of the so-called rare earth elements. Its presence in the friction wheel of cigarette lighters causes the spark that ignites the lighter fluid. An earlier use for the element, in the form of its oxides, was in mantles for gas-light flame.

The new application for cerium which Drs. Heidt and McMillan are studying employs two compounds, cerous and ceric

perchlorates. The cerous compound, the scientists have discovered, can make use of energy it absorbs from sunlight to combine with oxygen to become ceric perchlorate, and set free hydrogen, which they have detected being given off. At the same time, ceric perchlorate by the aid of sunlight can be reduced again to the cerous compound, giving off oxygen in the process.

The two chemical reactions go on at the same time in the same solution, the M.I.T. scientists find. The net result is the breaking up of water into hydrogen and oxygen with nothing but sunlight furnishing energy to this simple form of "battery."

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TECHNOLOGY

Roof Framing Technique Speeds House Building

► A ROOF framing method that speeds construction of one-story houses has been adapted to work on houses of one and a half stories. Called clear span framing, it permits rapid closing-in of the structure so that work still can go on during bad weather. It also lets the upper story of the house be used without load-bearing partitions on the lower floor.

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LARGEST FRESH WATER FISH—Edward Migdalski of Yale University, flanked by two Macushi Indians of British Guiana, exhibits the 148-pound *Arapaima gigas* he caught with the 12- to 15-pound line he is holding.

• RADIO

Saturday, April 4, 1953, 3:15-3:30 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS Station.

Philip Clapp and Dr. Joseph Smagorinsky, meteorologists of the U. S. Weather Bureau, discuss "Computing the Weather."

CHEMISTRY

Lead in Gas Removes Cylinder Wall Deposits

► WHAT HAPPENS to the lead that goes into an automobile with the "ethyl" gas has just been discovered.

Tiny lead-containing particles act as scavengers inside the cylinders. They fly about as the gasoline is burned, leaving one spot, alighting briefly on another. Their action tends to remove deposits of gasoline and oil residues by converting such material to more volatile forms.

These findings came from a study of radioactive lead incorporated into the tetraethyl lead widely used as an additive in gasoline. The research was carried out by Drs. H. P. Landerl and Bernard M. Sturgis, chemists with the Du Pont Company, and reported to the American Chemical Society meeting in Los Angeles.

By putting X-ray film over the deposits on the inside of automobile cylinders in which gasoline containing radioactive lead had been burned, they made the lead show where it goes. In a series of such pictures, the chemists could follow the formation of the cylinder deposits. The lead finally appears around the exhaust valves, the Du Pont chemists said.

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METEOROLOGY

Figure Where Sun Shines on New Homes

► YOU CAN now predict how much sun is going to shine, directly or indirectly, on the walls of your new house.

Two Massachusetts Institute of Technology weathermen have figured out a mathematical formula for computing the average direct and diffuse radiation on vertical and inclined surfaces in various places in relation to the sun, taking into account the factor of cloudiness. T. F. Malone and D. G. Friedman reported the formula to the meeting of the American Meteorological Society in Atlantic City, N. J.

They divide the percentages of possible sunshine into three classes. The frequency of occurrence of each class is related to the number of clear, cloudy and partly cloudy days and to the monthly average percentage sunshine. The work was done at the Blue Hill Observatory, Milton, Mass., but the scientists say it can be extended to other areas.

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