

Physical Sciences Notes

POLYMER PHYSICS

Russians Study Plastic Semiconductors

Cheap plastic transistors would be only one result if an efficient way of producing semiconducting polymers could be developed. Russian scientists, more enthusiastic than their U.S. counterparts, expect such materials would give clues to the way electric conductivity takes place in living cells.

According to Dr. Boris Davydov, by stretching the bonds between carbon atoms in some aromatic hydrocarbons such as anthracene, free electrons were produced in the molecular structure which could carry a current. By studying the way the current is carried, basic questions on how living matter conducts could be answered, Davydov says.

COMETARY ASTRONOMY

17 Periodic Comets Predicted

Comet-watchers will have a good year in 1967 if the sightings made during the first week continue even at half the pace.

Two periodic comets were spotted during the early days of 1967. Fifteen others are expected to come close to the sun during the rest of the year, according to the Smithsonian Astrophysical Observatory, international clearing house for astronomical information in Cambridge, Mass.

Comets, whether new ones or recoveries, are originally listed alphabetically by year. If nine new comets are discovered during 1967, an unusually high but not record-breaking number, astronomers will run out of alphabetical letters, which has never happened.

The comet predicted to be the brightest of the year, Comet Tuttle, is magnitude 14, two magnitudes fainter than expected. Therefore, neither it nor the rest of the lot can be photographed except through very large telescopes. The only hope, then, for naked eye comet watchers will be the discovery a new, bright comet.

CHEMISTRY

New Halogen Analyzer

The first commercial model of a device that can analyze halogen compounds and spot new ones has been installed at the University of Wisconsin.

Patterned on a model developed at Bell Laboratories, the instrument is called a nuclear quadrupole resonance scanner and was built by Wilks Scientific Co., South Norwalk, Conn.

Among the compounds being studied with the Wisconsin instrument are insecticides, including DDT and dieldrin; flame retardants, aerosol propellants and some antibiotics. The scanner permits detailed study of electron distribution and chemical bonding.

METALLURGY

Warmer Superconductivity

A team of California chemists has succeeded in raising the temperature at which superconductivity takes place in metals by creating a "molecular alloy" of metal

atoms and organic molecules.

Superconductivity, the loss of electrical resistance in metals, occurs in certain metals cooled close to absolute zero (minus 459.7 degrees F.). Each such metal has its own characteristic "transition temperature."

By vacuum-bonding tiny deposits of 12 different organic molecules on extremely thin films of vanadium, a Stanford University team headed by Prof. Harden M. McConnell found eight types of molecules that would make the metal's transition temperature rise, though the maximum rise was only one-tenth of a degree.

This is reportedly the first time that such a shift has been produced with organic molecules. Prof. McConnell believes that if the quantity of organic molecules increased, that the transition temperature should rise "exponentially," that is, at a steadily accelerating rate.

With more molecules, he hopes, the ability of the alloy to conduct electric current through both its organic and metallic components will also increase. This ability, called conductive conjugation, is not the only interaction in which molecules can affect transition temperature of molecular alloys, but, said Prof. McConnell, it is probably "the most likely" one that can produce large changes.

OCEANOGRAPHY

Group Named

There are so many agencies doing oceanographic research on their own that President Johnson, on the urging of the Congress, has named a special commission just to untangle the knots. The Commission on Marine Science, Engineering and Resources is long on organization men and short on scientists, simply because the problems are not oceanographic—but managerial.

Chief trouble-shooter is Julius Adams Stratton, board chairman of the Ford Foundation and former president of Massachusetts Institute of Technology.

Presently 14 federal agencies and departments, including State, Interior, Commerce, Treasury, Navy and Health, Education and Welfare, the Atomic Energy Commission and the National Science Foundation, are all engaged in oceanographic research. Washington now currently spends some \$200 million a year on oceanography and expects to double that soon.

METEOROLOGY

Air-borne Ice-Watch

Two flying laboratories carrying \$1 million worth of equipment have recently begun five-year studies of ice conditions in Canada.

The aircraft, converted DC-4's, will be flying over the Great Lakes, the St. Lawrence Seaway and offshore shipping lanes, as well as much of the Canadian Arctic.

Television and film cameras are mounted in pods covered with surplus canopies from F-86 Sabrejets. They are taking pictures from as low as 500 feet, with most studies being made from about 2,000 feet.

Each plane will fly an estimated 1,200 hours a year for the next five years, says the Canadian Department of Transport, which is conducting the research. Besides pinpointing the size and movements of ice fields, floes and bergs, the department hopes to use the studies to improve its weather forecasting ability.