CHEMISTRY

New Fluorocarbon Uses

➤ A RELATIVELY new family of organic chemical compounds known as fluorocarbons promises to have many important industrial applications in the future, ranging from combustion-resistant hydraulic fluids for airplanes to anesthetics, insecticides and germicides.

One important application will be as lubricants of unprecedented stability, for example an oil so stable that it will permit construction of engines hitherto impossible because no known lubricant could withstand their pressure and friction. Another important application is a new plastic extremely resistant to chemical reaction in which a derivative of fluorocarbons is employed.

Fluorocarbons are similar to the hydrocarbons of petroleum, but differ in that all the hydrogen is replaced by fluorine. The hydrogen is the point of chemical attack in the hydrocarbons. The absence of hydrogen in the fluorocarbons gives them extraordinary chemical inertness.

Difficulties in the manufacturing of fluorocarbons are responsible for delays in their production and application. Making them from free fluorine is dangerous because fluorine is the most active of all chemical elements. Now they are being made by a new electro-chemical process which entails no use of free fluorine.

This is being done by the Minnesota Mining and Manufacturing Company of St. Paul, but as yet only in a pilot plant. It is producing fluorocarbons in the form of solids, liquids and gases. Synthetic production is necessary because there is no natural source of fluorocarbons corresponding to petroleum and coal for hydrocarbons.

A chemically-inert plastic based on a fluorocarbon is produced by the M. W. Kellogg Company of Jersey City. The compound used is trifluorochloroethylene, or actually a polymer of this compound in which many molecules are linked together to form giant molecules. The plastic is an unusually stable, high-temperature material of the thermoplastic type which is not brittle although strong and hard, and gives satisfactory performance at low temperatures as well as at relatively high heat.

Science News Letter, January 1, 1949

On This Week's Cover

➤ A BACTERIAL cell, magnified 34,800 times by the electron microscope at the University of Wisconsin, is shown being attacked by virus particles, seen as irregular lumps on the edges of the cell. The white dots throughout the photograph are also virus particles.

Known as *Clostridium Madisonii*, it is the first bacteria species to be named after Madison, Wis., where it was isolated from soil in a University garden. It has been put to work by the acetone and butyl alcohol producing industry for it is less apt to be destroyed by virus than other fermentation bacteria.

Science News Letter, January 1, 1949

ENGINEERING

New Tank Engines Are Small But Powerful

➤ SMALL in size but large in power, a new type air-cooled engine for Army tanks is to be built in quantities for the government, it is now revealed. It is a 12-cylinder V-type model, built to use 80 octane gasoline, and rated at 810 horsepower without supercharger and 1,040 horsepower with this air-compressor device.

An initial $18,800,000 order for these engines has just been placed by the Army with Continental Motors Corp., Detroit. The 12-cylinder type to be built is one of six basic air-cooled engine models which Continental has developed for the Army. The engines will be constructed at Muskegan, Mich., in a Continental plant, and a government-owned factory.

The placement of this large government order is a movement by the Army to put into effect its engine standardization program. This will permit the interchange of parts on a broad scale and thus simplify field services and maintenance problems.

Science News Letter, January 1, 1949

Italy, during the first seven months of 1948, exported over 6,500 passenger cars and 2,700 other automotive vehicles.

Question Box

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BOTANY

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Photographs: Cover, University of Wisconsin; p. 3, USAF Air Materiel Command; p. 5, Westinghouse Electric Corp.; p. 7, Stanolind Oil and Gas Co.; p. 10, Harvard University; p. 11, General Electric Co.

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