

## CHEMISTRY

# Plastics From Waste

**Great piles of sawdust and sawmill wastes will supply enormous quantities of a new plastic, acetic acid and industrial alcohol.**

► GREAT piles of sawdust and sawmill wastes, common in America's lumbering and milling sections, will supply the United States and perhaps other countries with enormous quantities of a new plastic, and with acetic acid, industrial alcohol and certain chemicals, obtained by a new process revealed at the meeting of the American Chemical Society in New York.

The announcement follows several years of experimental work carried out at the Polytechnic Institute, Brooklyn, N. Y., by Dr. Donald F. Othmer, Dr. Robert S. Aries and Dr. Raphael Katzen. The new process was discussed by them at the meeting.

The new plastic, they said, is similar to many other plastics now on the market, which, however, are made from more expensive materials. Reclaiming mill waste through the process would provide a plentiful source of raw material, thus releasing more plastics for civilian use even before the end of the war.

The utilization of mill wastes and sawdust for plastics and other products is carried out in the Polytechnic Institute work, by means of a continuous method of chemically adding water to wood. Following this method, the group at the Institute reported, they obtained from a ton of sawdust "more than 1000 pounds of a high-grade ingredient for plastics, as well as valuable chemicals as by-products, including 120 pounds of acetic acid, 60 pounds of furfural, and 500 pounds of sugar, which would make hundreds of pounds of alcohol."

The recovery of the chemicals, they explained, is done by a special treatment of the liquors under pressure which breaks down their molecular structure, followed by the addition of other chemicals to absorb the valuable constituents and eliminate the water and impurities by means of a washing process.

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## Polymers and Plastics

► IT IS expected that after the war there will appear an even greater variety of plastics possessing a wide range of properties suitable for a great many more uses,

Dr. Frederick T. Wall of the University of Illinois stated at another group meeting of the Chemical Society.

"Although the development of plastics calls for contributions from practically all branches of chemistry and physics, that portion of synthetic chemistry known as polymerization contributes most directly to these new developments," he said.

Polymers are made up of very large molecules, and can be made from certain types of small molecules, called monomers, by a polymerization process. Polymers are various combinations of monomers in various sizes and shapes. The physical properties of the bulk polymer depends upon the size and shape of the individual molecules.

Polymerizing together more than one kind of monomer, a process known as copolymerization, gives large molecules of various compositions. Dr. Wall offered a new theory of the nature of the structure of copolymers which should prove helpful in understanding many of the problems encountered by scientists in the plastics industry.

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## Phosphor Crystals

► A RESPLENDENT new electronic era will be achieved after the war through the use of phosphor crystals, declared Dr. H. W. Leverenz of the Radio Corporation of America at the chemical meeting. "Phosphor crystals in fluorescent lamps will inexpensively illuminate workplaces and homes or gaily brighten the streets of our cities with varicolored sign tubing."

"Other phosphor crystals will display news and entertainment on the screens of our television sets," he said. "Kindred phosphors in the screens of electron microscopes will aid in fathoming the mysteries of bacteria and molecules in order to ensure a healthier and happier life." Many other uses were also suggested by him.

Phosphor crystals are phosphorescent substances that absorb light and continue to shine in the dark. They have been known for centuries but not put into practical uses until now when electronic

television research has devised highly efficient luminescent materials capable of glowing in practically any conceivable color.

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## INVENTION

## Controls on Home Furnaces Improved by New Devices

► FUEL CONTROL devices, several in number and timely with the present-day shortages of fuel, are among the 579 inventions of the past week on which patents were granted. One is a photoelectric-control automatic fuel shut-off for home oil and gas furnaces, claimed to be an improvement on earlier, somewhat similar devices. Another of particular interest saves fuel in large internal combustion engines by preventing them from running after the ignition has been shut off, a more or less common occurrence, due to pre-ignition, in aircraft, war tank, and other engines.

In the automatic fuel shutoff using the photoelectric control, light from the flame inside the combustion chamber in the furnace passes out through a small tubular opening in the front of the furnace to a photoelectric cell. The axis of the tubular opening and the axis of the flames are at an angle of from 30 to 45 degrees to each other as this gives the best results. When the light is cut off for any reason the cell actuates an electric control that operates a valve that regulates the flow of the fuel to the burner. It operates when the flame becomes extinguished, or if the mixture of fuel and air becomes too lean or too rich, thus decreasing the strength of the light.

Patent 2,360,166 was granted this device to Alfred F. Schumann of Lower Merion, Pa., and Alexander J. Turpin, Stewart Manor, N. Y., assignors to the Hauck Manufacturing Co., Brooklyn, N. Y.

The fuel control for internal combustion engines consists of a solenoid, which acts like an electromagnet, placed inside the housing of the degasser used in connection with the carburetor on heavy engines. When electrically energized, the solenoid operates a walking beam or lever and closes a throttle valve. The electric current to the solenoid is controlled by a switch on the dashboard.

The patentee is William E. Leibing, Detroit, Mich., who is assignor to Leibing-Fageol Co. of the same city. The patent is numbered 2,359,925.

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