The This Week

Education gets financial lift as the Government announces a four-year, $1 billion aid plan. States, too, are getting education conscious, with New York getting a plan to upgrade science teaching. Critics fear overemphasis on science. *Page 23.*

SPECIAL REPORT **Trend in the Philippines** toward industrialization has caused a sharp increase in consumption of chemicals. It has also caused renewed interest in the Islands' reserves of untapped natural resources. *Page 56.*

INDUSTRY & BUSINESS **Huge conversion job** faces chemical firms who draw power from Niagara Falls. But many involved have not yet worked out firm program for converting from 25-cycle to 60-cycle power. *Page 26.*

New name among suppliers to chemical industry results from consolidation of a number of firms controlled by Charles W. Engelhard. With annual sales of more than $200 million, it takes its place among the biggest companies in the U. S. that are still privately controlled. *Page 26.*

Drug firms feel optimistic about 1958, though earnings may not shoot skyward as sharply as they did last year. Influenza, polio vaccine, and a batch of new products hiked some 1957 earnings 20% above the 1956 level. *Page 28.*

MANAGEMENT **National Distillers' diversification plan** scores with year-end moves to push company further into chemical field. Full ownership of National Petro-Chemicals is one result, and other irons are on the fire. *Page 32.*

MARKETS **Exports of chemicals** and related products may reach $1.2 billion for 1957; general exports hit record level. A partial reason is pressure exerted on foreign sales by plentiful stocks of crude and manufactured goods here. *Page 36.*

RESEARCH **Simpler radioactive waste disposal** is GE's hoped-for use for an aluminum-sodium silicate gel that traps cesium-137 and strontium-90. Resulting material would be buried in a pit, without need for expensive steel tanks. *Page 42.*

Clathrating agents turn out to have broader uses than their first one—isolating *p*-xylene and ethylbenzene—Union Oil finds. If the proper agent is selected, other compounds can be separated, too. *Page 43.*

Battle over a name—niobium or columbium—continues in metallurgical circles. Chemists, however, seem willing to go along with IUPAC ruling. *Page 44.*

PRODUCTION **New powder metallurgy process,** Steelmet, gives high density structural parts. The process modifies chemical and physical properties of starting materials rather than changing later processing steps. *Page 45.*

CHEMICALS **New insecticides,** turned out by USDA chemists, are less toxic to warm-blooded animals than compounds used now. The insecticides are derivatives of chrysanthemumic acid found by synthesizing esters. *Page 48.*

CYANAMID

PETROCHEM LINES

NO. 13
OF A SERIES

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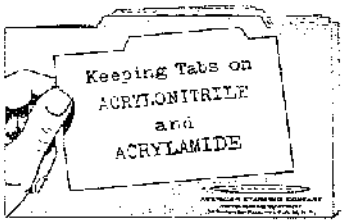
Handy New Booklet Summarizes "Acrylo" Reaction Techniques

Anyone who has tried to locate reaction information in a hurry will appreciate the unusual convenience of the "tab" booklet, "*Keeping Tabs on Acrylonitrile and Acrylamide.*" This new addition to Cyanamid's extensive Acrylo literature combines tab indexing with stepwise instructions for practical preparation of polymers, copolymers and other derivatives of Acrylonitrile and Acrylamide.



Facing each "reaction index card" is a page of text that discusses the reaction and its possible modifications, and also suggests application areas for the resulting products. Diagrams and specific reaction data, along with brief descriptions, give concise information useful to development and research chemists.

Seven reaction techniques are covered in this new booklet. Four are concerned with the techniques in polymerization and copolymerization that have found application in plastics, surface coatings, fibers, adhesives and textile chemicals. Covered also are cyanoethylation and carbamylethylation (with Acrylonitrile and Acrylamide respectively), and Diels-Alder reactions with dienes. In each case, literature references are given to facilitate further investigation.

The new "Keeping Tabs" booklet is the second of its type, following closely the "*Keeping Tabs on Acrylonitrile*" which has become a very popular reference for the many reaction possibilities of this reactive monomer and intermediate. Both of these booklets are available on request from Cyanamid... and they are only part of the extensive library of books, special reports and current bibliographies which Cyanamid offers on both Acrylonitrile and Acrylamide.

Acrylonitrile in Paracrils

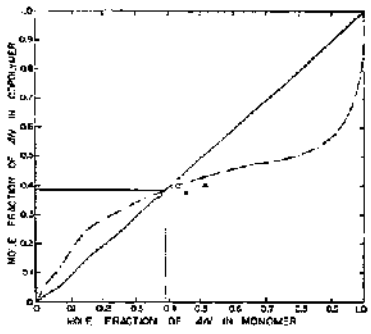
Paracrils are oil-resistant chemical rubbers manufactured and supplied by the Naugatuck Chemical Division of the United States Rubber Company. They are produced by the copolymerization of butadiene with Acrylonitrile.

Three low-temperature polymerized Acrylonitrile rubbers, Paracrils BLT, BJLT and CLT, have been added to the growing family of Paracril oil-resistant synthetics. Compared respectively to the regular high-temperature polymerized Paracrils B and C they offer better processing qualities; maximum processing safety; increased resistance to oil, fuel and water; and improved physical properties in vulcanizates -- particularly in low hardness compounds.

Paracrils are particularly suitable for application involving contact with petroleum products and other oils over a wide range of temperatures. They can also be satisfactorily used wherever a rubber-like material is needed. The lower Acrylonitrile content Paracrils provide moderately low oil resistance but also maximum flexibility for low temperature service. The higher Acrylonitrile content polymers furnish the highest oil resistance but sacrifice some low-temperature flexibility and resilience.

Copolymerization of Acrylonitrile with Styrene

Among all commercial monomers, Acrylonitrile is unusual in having appreciable solubility in water, permitting copolymerization with either water-soluble or water-insoluble monomers. Furthermore, because of this property, Acrylonitrile may be copolymerized with styrene, for example, by any technique desired—bulk, emulsion, solution or suspension. The suspension copolymerization of styrene with Acrylonitrile offers an interesting study.* Because of the distribution of Acrylonitrile between the aqueous and oil phases, the composition of the copolymer can be uniquely regulated as illustrated:



Note the reverse curve effect with respect to the diagonal. At the point of intersection an azeotrope is formed and the composition of the copolymer and monomer feed are identical; roughly 39 mole per cent of Acrylonitrile.

As thermoplastic molding compounds, styrene-acrylonitrile copolymers show marked improvement over polystyrene in:

- flexural strength and elongation
- oil and solvent resistance
- surface hardness; abrasion resistance
- heat-distortion temperature
- impact and tensile strengths

Ask your Cyanamid Petrochemicals representative for a reprint of the reference cited.

*G. Mino, J. Polymer Sci., XXII, 102 (Dec. 1956)

The Chemical World This Week

CONTINUED

EQUIPMENT **Chloride ion analyzer** is a new tool for continuous process stream analysis. The instrument, developed by Beckman, detects and measures chloride ion concentration, gives readings in parts per million. *Page 50.*

INTERNATIONAL **Charter for European Nuclear Energy Agency** is adopted by OEEC council. New agency will seek to develop production and use of nuclear energy for peaceful purposes by technical cooperation among Western European countries. *Page 62.*

Major salt supply is being exploited on Mexico's west coast by Exportadora de Sal. Continually replenished by Pacific tides, deposits could yield several million tons yearly. *Page 62.*

EDUCATION **Future U. S. supply of new scientists**—BS's and PhD's—will be predicted by Office of Education, starting this spring. Yearly surveys of college juniors in science and mathematics will give much needed data on drop-outs. *Page 64.*

ASSOCIATIONS **More than 150 papers** will be included in sessions planned for Feb. 5 meeting in Philadelphia by Delaware Valley Local Sections of ACS. *Page 70.*

PEOPLE **Crawford H. Greenewalt** of Du Pont gets William Procter Prize for Scientific Achievement at AAAS meeting in Indianapolis. *Page 76.*

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