

THE CHESAPEAKE CHEMIST

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THE MARCH MEETING

The Maryland Section will hold its next meeting on Friday, March 30, in Remsen Hall on the Homewood campus of The Johns Hopkins University. The speaker will be Dr. Frank R. Mayo, of the General Electric Company, who will speak on "The Three Mechanisms of Vinyl Polymerization".

Dr. Mayo holds the title of "Research Chemist" at the laboratories of General Electric Company in Schenectady. He is a graduate of the University of Chicago, and after receiving his undergraduate and graduate degrees there was Eli Lilly Fellow at the University. He spent two years as research chemist with DuPont, then in 1936 returned to the University of Chicago as Instructor in Organic Chemistry. He left the University in 1942 to do research with U. S. Rubber Company before joining General Electric. He has done research on reaction kinetics, on addition reactions of the olefines and on addition and substitution reactions of the halogens. He is a recognized authority in the field of polymerization reactions and is active in the Division of High Polymer Chemistry of the American Chemical Society.

Dr. Mayo's discussion of polymerization will emphasize the fact that, although catalysts as diverse as aluminum chloride, organic peroxides and sodium metal have long been employed to bring out the polymerization of ethylene derivatives, understanding of their action is a relatively recent development. Copolymerization studies demonstrate clearly that there are three, and probably only three, general mechanisms by which unsaturated compounds can polymerize, involving, respectively, carbonium ions, free radicals or carbanions. Acids and metal halides are catalysts for the carbonium ion mechanism which is restricted mostly to unsaturated hydrocarbons and ethers. Alkali metals and their salts with very weak acids are catalysts for the carbanion mechanism, restricted mostly to nitro-, cyano- and (to page 2

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FUTURE MEETINGS

The Remsen Memorial Lecture Committee, through the Chairman, Dr. Robert D. Fowler, has announced that the Remsen Lecturer for 1954 will be Dr. Hugh Stott Taylor, Dean of the Graduate School at Princeton University and former chairman of the Chemistry Department there. Dr. Francis Owen Rice of Catholic University, a former chairman of the Maryland Section, will introduce the lecturer. The Remsen meeting will be held on Friday, May 25, in Remsen Hall.

Dr. Hellerman, Program Chairman for the Maryland Section, has announced our good fortune in securing as speaker for the April meeting Dr. Joseph R. Spies of the Allergen Research Division, Bureau of Agricultural and Industrial Chemistry, U. S. Department of Agriculture, who will discuss "The Chemistry and Some Physiological Properties of Oilseed Allergens". Dr. Spies is one of the 1954 winners of the Hillebrand Prize from the Washington Section, A.C.S., which was awarded for his part in work on these allergens. This meeting will be held on Thursday, April 25. (Note the change in the day of meeting to Thursday.)

These meetings will complete the program for the spring, and give promise of interesting and profitable discussions which deserve the attendance of all members of the Maryland Section.

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from page 1) The March Meeting

carbalkoxy-substituted ethylenes and to conjugated hydrocarbons. Peroxides and related compounds initiate polymerization by a free radical mechanism, applicable to a large variety of ethylene derivatives. The effects of temperature and inhibitors, and the possibilities of copolymerization, differ greatly among the three mechanisms but a consistent picture and bases for prediction of behavior in vinyl polymerization can now be presented.

Preceding the lecture, the Section will hold a dinner in honor of the speaker. Dinner will be served at 6:30 at the Johns Hopkins Club on the Homewood Campus, and is open to members of the Section and their guests. Reservations should be made by Thursday noon, March 29, with Dr. Leslie Hellerman, Department of Physiological Chemistry, Johns Hopkins School of Medicine, Baltimore 5, phone ORleans 4700, or with the secretary, Mrs. Corliss, at the same number.

from page 4 Latex and Rubber, Inc.

ammonia to prevent the growth of bacteria. Other important tests are for dry rubber content, total solids, KOH number (KOH titration with a pH meter to determine the amount of acid constituents in the latex) and mechanical stability. At times it is also necessary to determine viscosity, surface tension and copper-manganese content.

Natural rubber latex is used in the manufacture of many items essential to modern civilization, among which are latex foam mattresses, pillows, upholstery for both automobiles and furniture, rug underlay, balloons, rubber gloves, adhesives, drug sundries, elastic thread and many miscellaneous materials. A great deal of chemistry is involved in manufacturing processes using latex. The preparation of the dispersions used for compounding is a colloid chemistry problem. The testing of the final products comes in the field of physical chemistry. Inorganic as well as complex organic chemicals are used as compounding ingredients.

Though a large quantity of latex is received in Baltimore, only a small portion is actually consumed in Maryland. Much of it is shipped to various places in Ohio, Indiana and to states on the Atlantic seaboard, particularly Pennsylvania and New Jersey. Shipment from Baltimore to consumers is by railway tankers, tank trucks and drums.

(Editor's note: Dr. Meyer is Technical Representative with Latex and Rubber, Inc. Those Maryland Section members who remember Dr. Meyer when he was a graduate student in the Department of Chemistry at The Johns Hopkins University are happy to welcome him back to Baltimore after the years which he spent at the rubber plantations of the East Indies.)

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NEWS OF MARYLAND CHEMISTS

Edward S. Hopkins, former Chairman and Secretary-treasurer of the Maryland Section, has just published a new book with Francis B. Elder as co-author. The book is titled "The Practice of Sanitation", is published by Williams and Wilkins, and deals, in part, with disinfection, food sanitation, milk products, water supplies, sewage and refuse disposal, stream pollution, ventilation, swimming pools, insect and rodent control, and the relation of sanitation to public health. Mr. Hopkins is also author of "Water Purification Control", the third edition of which was published last year. He is Principal Associate Engineer of the Bureau of Water Supply of Baltimore.

Dr. C. Jelleff Carr of the Department of Pharmacology of the Medical School of the University of Maryland, has been invited to present a review of the metabolism of the sugar alcohols in one of the symposia planned for the American Chemical Society in New York in September.



Dr. Mayo

NEXT MEETING March 30 TIME 8:30 P.M.
 PLACE Room 401, Remsen Hall, Johns Hopkins
 Charles & 34th Streets
 SPEAKER
 Dr. Frank R. Mayo
 SUBJECT The Three Mechanisms of Vinyl
 Polymerization
 DINNER 6:30, The Johns Hopkins Club
 Charles & 34th Streets
 The meeting is open to any who are interested.
 Save THURSDAY, April 26, for the next meeting.

GETTING ACQUAINTED WITH CHESAPEAKE CHEMISTRY

XXIII LATEX AND RUBBER, INC.
by Glen E. Meyer

One of the important, though little known, activities in the Port of Baltimore is the importation of natural rubber and natural rubber latex. Of the approximately 5000 tons of rubber received in this country each month as latex, about one-third enters by way of Baltimore, and the proportion is increasing. The chemists of Baltimore, however, are largely unaware of this activity.

Latex and Rubber, Inc. has a new and modern installation for bulk handling of latex in Baltimore. Their facilities at 4075 Hull Street include ship discharge pumps, pipe lines, underground concrete storage tanks, modern office space and a chemical laboratory provided with all the equipment required for the numerous control tests used in establishing latex quality.

Latex, as it is obtained from the *Hevea brasiliensis* trees, is a colloidal dispersion containing approximately 35% rubber. After concentration by any of the standard procedures it contains from 60 to 65% rubber, depending upon the process used. The preparation of latex to make it suitable for shipment to this country and for the fabrication of consumer goods has been developed into very precise technical processes. There are four well recognized concentration procedures; centrifugation, creaming, evaporation and electrodecantation. In each procedure it is necessary for the latex to be preserved within an hour or two after its collection to prevent bacterial action which would result in coagulation of the rubber. Relatively sterile conditions must be maintained all the way from this initial preservation to the final consumption in factories. Ammonia is the most widely used preservative and is the only preservative for more than three-quarters of the latex shipped to this country. In most of the remaining quarter ammonia is used with an auxiliary preservative such as sodium pentachlorophenate.

In the preservation of latex the contribution of the bacteriologist cannot be neglected; however, only the chemistry involved will be considered here. Determination of the ammonia content of the latex is of prime importance to make sure there is sufficient

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