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Preface

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Preface

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Chemical modifications of polymers may be used to prepare polymers, such as poly(vinyl alcohol), which cannot be synthesized in other ways, but the main reason is the modification of raw material to give it improved or specific properties; to do that, it is tempting to start from a cheap existing raw material rather than design a new material, and of course PVC is well suited.

The main deficiency of PVC is its poor thermal stability, so that we are obliged to introduce many additives for processing. A slight and inexpensive chemical modification, to get a more stable polymer is an exciting project which has been reviewed in the main lecture by Dr. Suzuki. It seems that this purpose may be fulfilled after grafting other polymers like styrene or isobutylene, as shown by Prof. Kennedy, who acted as a very efficient discussion leader in this session. A very interesting solution, i.e., additives leading to chemical modifications during processing, has been described by Prof. Nakamura: a further advantage of this solution is to offer the possibility of crosslinking the polymer, so that its heat distortion temperature is increased. Different ways to get block or graft polymers have been described by Prof. Kennedy (cationic grafting), Dr. Pillot (anionic grafting), Dr. Bartoň (radical block copolymerization), and Prof. Garnett (radically grafted copolymers). Some applications of these last to the fixation of enzymes or complex catalysts have been shown and discussed.

Chemical modifications in order to get new polymers have been described by Dr. Michel (by ozonolysis, which gives telechelic chlorinated diacids containing peroxide groups) and by Dr. Östensson (by

ionic dehydrochlorination, giving polydienes where a lot of functional groups may be further fixed).

Only one chemical modification has already reached the industrial level, namely, chlorination. Dr. Kolinsky described very fine studies improving our knowledge of the fine structure of chlorinated polymers.

As for other topics of this Symposium, we had not only one main lecture and several contributed papers, but also a rather important panel discussion with the participation of Prof. J. P. Kennedy (University of Akron, USA) as a discussion leader, Prof. Y. Nakamura (Iwate University, Japan), Dr. Caraculacu (Institute of Macromolecular Chemistry, Romania), and Dr. Millán (Instituto de Plasticos y Caucho, Spain), each of them giving a presentation of various aspects of chemical modification. A general discussion finally followed with the active participation of many people in the audience. I would like to take this opportunity to thank everybody for his appreciated cooperation.

This symposium has shown that there is a high level of activity in the field of chemical modification of PVC. However, most of the work was done in solution, and then may be rather well understood. A lot of work remains to be done if we want to have good control and understanding of the chemical modification of solid polymers. Practically nothing is known about the influence of the morphology of powdered PVC, such as produced in the polymerization plants, on the rate and extent of chemical modifications. Since most of the economically acceptable processes would certainly imply working in the solid state, I think some work of the kind will be done before the next PVC symposium.