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Symposium on the Polymerization of Cyclic Ethers and Sulfides

M. P. Dreyfuss[a]
[a] Corporate Research The B. F. Goodrich Company, Brecksville, Ohio

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Symposium on the Polymerization of Cyclic Ethers and Sulfides

INTRODUCTION

Ring-opening polymerization of cyclic ethers and sulfides has long been exciting broad interest as a distinct area of specialization. Often it was useful to include discussions of these studies as part of other areas such as anionic or cationic polymerization. However, these ring-opening polymerizations have likewise been the sole subject of successful symposia. The time lapse since the previous such ACS sponsored symposium and the worldwide effort since then amply justified this American Chemical Society sponsored symposium held in Boston, Massachusetts, April 11 and 12, 1972. Judging from its reception, I felt it was a successful and timely symposium. I think this attests to the considerable amount of good work being done in the area and to the advances that are being made. Not only are there a number of important products on the market based on this chemistry, but also considerable basic chemical knowledge has evolved, leading in turn to still more products.

By including both cyclic ethers and their sulfur analogs in one symposium we were able to compare and contrast these interesting systems to the mutual benefit, I believe, of those particularly interested in the polymerization of one or the other groups of monomers. By including the commercially very important 1,2-epoxides we were able to span the range of anionic, cationic, and coordinate polymerization mechanisms. It should be recalled that the four-membered ring ethers (but not necessarily sulfides) and higher members polymerize only by a cationic mechanism.

Significant developments in special areas were also included in our symposium. We were fortunate that the development of a convenient and unique means of easily generating a dicationically active (amphicationic) polyether could now be revealed and discussed. Also the

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measurements of the effects of the free ion-ion pair equilibrium in cationic cyclic ether systems has now been measured and were presented. Indeed, similar measurements were also reported in the cyclic sulfide area. These studies provide a most interesting comparison with the now well-known and dramatic effects known to exist in anionic olefin polymerizations. Our symposium also brought out the possibility of a further related factor which will provide some very interesting data in the future, namely, an equilibrium between a covalent ester and a free ion (or ion-pair).

Unfortunately not all of the speakers at the symposium are represented in this volume. Some had made previous commitments to publish their papers elsewhere. Happily, we are able to include two of these papers. The authors involved and the publisher, the American Chemical Society, have very kindly consented to reprinting these papers in this volume. Consequently, we are better able to maintain the continuity and flavor of the symposium as it was held. However, I have chosen to reprint only the results and discussion sections. The originally published articles are widely available and will have to be referred to if the reader is interested in the experimental detail. Also, one paper is included which was not presented at the symposium. Dr. St. Penczek of the Center of Macromolecular Studies of the Polish Academy of Sciences was not able to attend. However, he did suggest the possibility of a written contribution. I happily accepted his offer and thus he becomes a welcome addition to our symposium at this time.

Finally, I want to thank all the participants for their very fine contributions, for their cooperation in getting their abstracts and preprints to me in time, and for their patience in preparing and revising their manuscripts. And I hope I will be forgiven for singling out one author, P. Dreyfuss of Case Western Reserve University, to thank individually for so ably preparing and presenting the introductory survey lecture and for assisting me in many other aspects of the symposium and its publication.

M. P. Dreyfuss

Corporate Research
The B. F. Goodrich Company
Brecksville, Ohio 44141

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