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Preface: Proton Traps in Cationic Polymerization

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Preface: Proton Traps in Cationic Polymerization

The articles in this special issue concern research carried out at the Institute of Polymer Science during the period 1977-1981. Two preliminary communications have appeared in Polymer Preprints (Parts I and II, included for the sake of completeness) and some results have been described at the 5th International Symposium of Cationic Polymerization in 1979 in Kyoto [J. P. Kennedy, Polym. J., 12, 609 (1980)].

The fact that cationic polymerizations can be carried out in the presence of proton traps (sterically hindered bases) was discovered by us in 1977 (see Setting the Stage). It became immediately apparent that proton traps are most valuable diagnostic tools, enabling the differentiation between protic and aprotic initiation, and that controlled carbocationic initiation and suppression of chain transfer to monomer will become possible by the use of these materials. The significance of proton traps in cationic polymerizations would have been firmly assured by these developments alone; however, the unexpected bonuses of molecular weight enhancement and narrowing of molecular weight dispersion caused by proton traps rendered this discovery important both from the scientific and technological points of view.

In view of the coherence of the research with proton traps, we decided to delay publication of our results and to present them to the scientific community in one issue instead of serializing them in various journals. The first article "Setting the Stage: A Brief Introduction to Sterically Hindered Amines in Organic Chemistry and Scouting Experiments" serves to provide a background to our work. The subsequent articles concern detailed descriptions of individual carbocationic systems in which the effects of proton traps have been investigated.

We hope that this special issue on proton traps will help to initiate many further investigations in this most fascinating field of polymer science.

J. P. Kennedy

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