

THERMAL CATIONIC POLMERIZATION OF TETRAHYDROFURAN INDUCED BY DIPHENYLIDONIUM SALT IN THE PRESENCE OF COMMON SOURCES OF FREE RADICALS.

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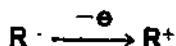
SUMMARY

Bulk polymerization of tetrahydrofuran has been studied utilizing diphenyliodonium hexafluorophosphate in the presence of phenylazotriphenyl methane, benzoyl peroxide and 2-2'-azo-bis. isobutyro nitrile. The effects of the cationic salt and free radical initiator on the rate of polymerization have been investigated for all initiation systems.

INTRODUCTION

In recent years, there has been a growth of interest in the development of new initiators for cationic polymerization¹⁻³. Aryl diazonium salts⁴ ($ArN_2^+X^-$), diaryl iodonium salts⁴ ($Ar_2I^+X^-$) and triaryl sulfonium salts ($Ar_3S^+X^-$) are especially useful as photochemical initiators for cationic polymerizations of epoxides, alkyl vinyl ethers and other related monomers. Only aryl diazonium salts are known to decompose thermally⁵, although all three types of salt yield cationic species on u.v. irradiation at appropriate wavelength.

Recently, Ledwith and co-workers⁷⁻⁹ have presented an evidence for the oxidation of electron-donor free radicals to corresponding carbocations;



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and experimental results for its application to polymerizing systems.

In continuation of these studies we now report the use of thermally decomposing free radical sources in cationic polymerization of tetrahydrofuran and mechanistic details are presented.