

P R E F A C E

The importance of homopolymers and their foams in an extensive end-use area has grown quite considerably in the last few decades. Besides this the low-lossy and low-loss graded dielectrics and foam-encapsulants are essential in modern scientific pursuits. But available data on the dielectric properties of homopolymers, copolymers, blends and their foams are too scanty and limited only to lower frequencies.

In the present series of investigations, as embodied in this thesis, the microwave dielectric behaviour polystyrene, poly(methylmethacrylate), polypropylene styrene-methylmethacrylate copolymers, polystyrene-poly(methylmethacrylate) blends and their foams has been studied.

The subject matter of this thesis has been presented in five chapters. Besides introductory part, the first chapter includes a concise review of the earlier work and a scope of the present investigation.

The second chapter includes the experimental procedures adopted for foam-generation, sample preparation, measurement of dielectric and mechanical properties.

The experimental result presented in the form of tables have been given in Chapter - 3.

Chapter - 4 is a systematic discussion of the results of investigation. The method of foam-generation adopted during this work has been justified, the various peaks in the dielectric spectra have been identified and attributed to different relaxation processes. While doing so the activation energies for excitation of conductivity, dipole energies and relaxation times have been elaborately compared. A comparison based on morphological studies by optical and scanning electron microscopy has also been presented. Results of mechanical behaviour of polymers have also been elaborately discussed.

Chapter - 5 is a brief summary of what has been presented in the previous section inclusive of the conclusion arrived at with respect to the systems chosen for study.

The author has freely consulted the chemical abstracts, reviews, Journals and the standard text books on the subject in the preparation of the manuscript.