

STUDIES ON THE DIELECTRIC BEHAVIOUR OF POLYPYRROLE AND ITS SEMI INTERPENETRATING NETWORKS WITH POLY (VINYL CHLORIDE) IN THE MICROWAVE FIELD

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ABSTRACT

Polypyrrole/poly (vinyl chloride) semi interpenetrating networks is found to exhibit dielectric properties higher than that of polypyrrole alone in the microwave frequencies. Polypyrrole was prepared using ammonium per sulfate initiator at room temperature, and the dielectric properties in the microwave frequencies were measured. Polypyrrole was then doped with different dopants and dried in oven (50-60⁰C for 6 hrs.). The dielectric properties of HCl doped polypyrrole show better results. Polypyrrole/poly (vinyl chloride) semi interpenetrating networks of different compositions were prepared in pellet form and film form and its dielectric properties were studied at different microwave frequencies. An HP 8510 Vector network analyzer interfaced with a computer was used. Cavity perturbation technique was employed for the study. The dielectric properties like permittivity, dielectric loss, dielectric conductivity, dielectric heating coefficient, loss tangent, absorption coefficient and penetration depth were studied. Measurements were performed at different frequency bands.

Key words: Polypyrrole, Poly(vinyl chloride), Cavity perturbation technique, dielectric properties.

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