

Thermal Degradation Studies of Copolymer Derived from 2,2'-Dihydroxybiphenyl, Ethylenediamine and Formaldehyde

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Abstract: Copolymer (2,2'-BPEDF) was synthesized with molar ratio 3:1:5 of monomer 2,2'-dihydroxybiphenyl (BP), ethylenediamine (ED) and formaldehyde (F) by condensation polymerization, in acidic medium and refluxing in oil bath at 120°C for 5 h. Composition and structure of organic copolymer have been determined by elemental analysis and molecular weight determination by non-aqueous conductometric titration method. The UV-visible, FTIR and proton nuclear magnetic resonance (¹H NMR) spectra were studied to elucidate the structure. The surface features and crystalline behaviour of the copolymer was analysed by scanning electron microscope (SEM). Non isothermal thermogravimetric analysis for determination of their mode decomposition and relative thermal stability, Energy of activation, frequency factor and order of reaction have been calculated by Sharp-Wentworth (SW) and Freeman-Carroll (FC) methods. Energy of activation determined by Sharp-Wentworth and Freeman-Carroll methods are in agreement with each other. The order of reaction is found to be 0.98.

Keywords: Synthesis, Thermal, ethylenediamine, Kinetic parameter, Polycondensation, structure, composition, Thermal stability.

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