J Material Sci Eng 2017, 6:9 (Suppl)
DOI: 10.4172/2169-0022-C1-086

Synthesis, structural study and thermokinetic parameters of terpolymer derived from p-hydroxybenzaldehyde, thiourea and ethylene glycol

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Terpolymer abbreviated as HBTE-I and HBTE-II were synthesized by polycondensation of p-hydroxybenzaldehyde, thiourea and ethylene glycol using molar ratio 1:1:3 and 2:1:4 respectively of monomers in presence of polyphosphoric acid as catalyst at 120°C. The tentative structures of terpolymer are determined by Elemental analysis, 1H NMR, FT-IR and UV-Visible spectra. The molecular weights of terpolymer were determined by non-aqueous conductometric titration. The molecular weights of HBTE-I and HBTE-II were found to be 3047 and 5964 respectively. Thermokinetic parameters were calculated by using Freeman-Carroll and Sharp-Wentworth methods in the temperature range 180°C–511°C. The values of the activation energy (Ea), frequency factor (A), apparent entropy change (ΔS*) and free energy changes (ΔG) were in good agreement. The order of degradation reaction determined by the FC method was confirmed by SW method.

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