



Thermal and Kinetics studies of diazotised resins from renewable resource

S.G.Jebastin Andrews^{1*}, V.Rama² and C.V.Mythili³

¹Department of Chemistry, V V College of Engineering, Tisyanvilai, TamilNadu, India.

²Department of Chemistry, Sarah Tucker College, Tirunelveli, TamilNadu, India.

³Department of Chemistry, Rani Anna Govt. College for Women, Tirunelveli, TamilNadu, India

Abstract:As an alternate to the use of conventional reinforcing synthetic resins, biobased resins were synthesized from renewable resources such as cardanol and furfural. Cardanol is the meta-substituted phenolic compound isolated from cashew nut shell liquid (CNSL), a byproduct of cashew industry. P-chloroaniline has been diazotised and coupled with cardanol to prepare diazotised p-chloroaniline cardanol dye (bio monomer). The obtained dye has been condensed with furfural in presence of 3N.H₂SO₄ to give diazotized p-chloroaniline cardanol furfural (homo polymer) resin. The condensed resin has been allowed to react with urea, ethylene glycol, resorcinol and o-hydroxy benzoic acid to form various copolymer resins. These resins have been characterized by Fourier Transform-Infrared spectroscopy (FT-IR), ¹H-Nuclear Magnetic Resonance spectroscopy (¹H-NMR), X-ray diffraction (XRD), Thermogravimetric Analysis (TGA) and Differential thermal analysis (DTA) studies. XRD techniques are used to distinguish the state of polymer, i.e. crystalline or amorphous etc., to calculate percentage crystallinity. The energy of activation for different stages of polyurethane degradation is determined by Coats-Redfern integration method which involves different kinetic models.

Keywords: cardanol, crystallinity, X-Ray diffraction, energy of activation.

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