

Preparation of Biodegradable Bioepoxy Resins from Waste Vegetable Oil for Sustainable Development

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Abstract

Novel biobased epoxy resins were prepared from waste vegetable oil by epoxidation using hydrogen peroxide in acetic acid. Biobased epoxy resins were prepared by reaction of acid hardeners such as citric acid (B1), tartaric acid (B2), succinic anhydride (B3) and sebacic acid (B4) with epoxydised waste vegetable oil. The intrinsic viscosities were in the range of 0.06 to 0.70 (dL/g) and thermally stable up to 350°C. Solution cast thin films are transparent except B4. The resin films were completely biodegraded by using bacterial granules (made up of bacterial consortia) within 14-135 days. The resin (B1) was found to be biocompatible based on blood clotting studies.

Keywords: Biobased Hardeners, Biodegradable Epoxy Resins, Waste Vegetable Oil