

Producing Jatropha oil-based polyol via epoxidation and ring opening

ABSTRACT

A low viscosity polyol has been functionalized from crude Jatropha oil via epoxidation and subsequent ring-opening. Starting with the crude Jatropha oil, the double bonds are functionalized by introducing epoxy groups and ring-opened to produce hydroxyl groups. The experiment employs more concentrated 50% hydrogen peroxide and effectively produce solvent-free epoxidized Jatropha oil within shorter reaction time of 5 h with maximum oxirane oxygen content of 4.30% and viscosity of 0.57–0.60 Pa.s. The epoxidized Jatropha oil is then transform into Jatropha-based polyol with hydroxyl number of 171–179 mg KOH/g, low viscosity of 0.92–0.98 Pa.s. and functionality of 5.1–5.3. The epoxidation and ring-opening process are monitored by viscometer and FTIR. The produced polyol permit more time for molding and additives addition during polyurethane due to its low viscosity.

Keyword: Epoxidation; Hydroxylation; Renewable polyol