



**Studies on the Structural Changes during Curing of Epoxy and it's Blend with CTBN****Kavita Srivastava<sup>1</sup>, Ashwani Kumar Rathore<sup>2</sup> and Deepak Srivastava<sup>3</sup>**<sup>1</sup>*Department of Chemistry, V.S.S.D. College, Nawab Ganj, Kanpur – 208 002 (U.P.), India.*<sup>2</sup>*School of Chemical Technology – Department of Chemical Engineering*<sup>3</sup>*School of Chemical Technology – Department of Plastic Technology**H. B. Technical University (Formerly H. B. Technological Institute)**Kanpur – 208 002 (U.P.), India.***Abstract**

Cashew nut shell liquid (CNSL), an agricultural renewable resource material, produces natural phenolic distillates such as cardanol. Cardanol condenses with formaldehyde at the ortho- and para-position of the phenolic ring under acidic or alkaline condition to yield a series of polymers of novolac- or resol-type phenolic resins. These phenolic resins may further be modified by epoxidation with epichlorohydrin to duplicate the performance of such phenolic-type novolacs (CFN). The structural changes during curing of blend samples of epoxy and carboxyl terminated poly (butadiene-co-acrylonitrile) (CTBN) were studied by Fourier-transform infrared (FTIR) spectrophotometer. The epoxy samples were synthesized by biomass material, cardanol. Blend sample was prepared by physical mixing of CTBN ranging between 0-20 weight percent CTBN liquid rubber into cardanol-based epoxidized novolac (CEN) resin. The FTIR spectrum of uncured blend sample clearly indicated that there appeared a band in the region of 3200-3500  $\text{cm}^{-1}$  which might be due to the presence of phenolic hydroxyl group and –OH group of the opened epoxide. Pure epoxy resin showed peaks near 856  $\text{cm}^{-1}$  which might be due to oxirane functionality of the epoxidized novolac resin. Both epoxy and its blend sample was cured with polyamine. The cure temperature of CEN resin was found to be decreased by the incorporation of CTBN. The decomposition behaviour was also studied by thermogravimetric analyser (TGA). Two-step decomposition behavior was observed in both epoxy and its blend samples.

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