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Synthesis and Characterization of Renewable Resource Based Green Epoxy Coating

Authors : Sukanya Pradhan, Smita Mohanty, S. K Nayak

Abstract : Plant oils are a great renewable source for being a reliable starting material to access new products with a wide spectrum of structural and functional variations. Even though petroleum products might also render the same, but it would also impose a high risk factor of environmental and health hazard. Since epoxidized vegetable oils are easily available, eco-compatible, non-toxic and renewable, hence these have drawn much of the attentions in the polymer industrial sector especially for the development of eco-friendly coating materials. In this study a waterborne epoxy coating was prepared from epoxidized soyabean oil by using triethanolamine. Because of its hydrophobic nature, it was a tough and tedius task to make it hydrophilic. The hydrophobic biobased epoxy was modified into waterborne epoxy by the help of a plant based anhydride as curing agent. Physico-mechanical, chemical resistance tests and thermal analysis of the green coating material were carried out which showed good physic-mechanical, chemical resistance properties as well as environment friendly. The complete characterization of the final material was done in terms of scratch hardness, gloss test, impact resistance, adhesion and bend test.

Keywords : epoxidized soybean oil, waterborne, curing agent, green coating
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