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Preparation and research of epoxy modified by carboxyl-terminated polybutylene adipate at room temperature

编号	020035802
推送时间	20220829
研究领域	林产化工
年份	2022
类型	期刊
语种	英语
标题	Preparation and research of epoxy modified by carboxyl-terminated polybutylene adipate at room temperature
来源期刊	RSC Advances
期	第358期
发表时间	20220715
关键词	NANOFILLERS ; IMPROVEMENT ; RESIN ;
摘要	<p>In this study, carboxyl-terminated polybutylene adipate (CTPBA) was used to modify epoxy resin, and the modified epoxy resin was cured by a room temperature rapid curing agent (T-31). The effects of CTPBA modification on bonding properties and mechanical properties of epoxy resin adhesive at room temperature were carefully studied. Epoxy-terminated prepolymer was synthesized by pre-polymerization and its structure was characterized. Compared with the addition method of direct blending, the bonding properties and mechanical properties of pre-polymerized epoxy resin adhesive were significantly better. Compared with unmodified epoxy resin, CTPBA modification significantly improved the bonding strength. Furthermore, with the increase of CTPBA content, the shear strength of the material increased first and then decreased, and reached the maximum when the addition amount was 40 phr. This shows that the tensile strength of the material decreased with the increase of CTPBA content, and the elongation at break increased with the increase of CTPBA content. Dynamic mechanical analyzer (DMA) test results showed that the addition of CTPBA reduced the glass transition temperature, but broadened the damping temperature range. TG analysis showed that the thermal stability of the modified epoxy resin was good, and compared with pure epoxy resin, the initial temperature of thermal weight loss and the maximum thermal decomposition rate decreased, but the overall thermal stability was not significantly different. In summary, CTPBA modification of epoxy resin is expected to improve the comprehensive mechanical properties at room temperature.</p>
服务人员	尚玮姣
服务院士	宋湛谦
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