数据资源：林业专题资讯

打印 下载 A+ A- 分享

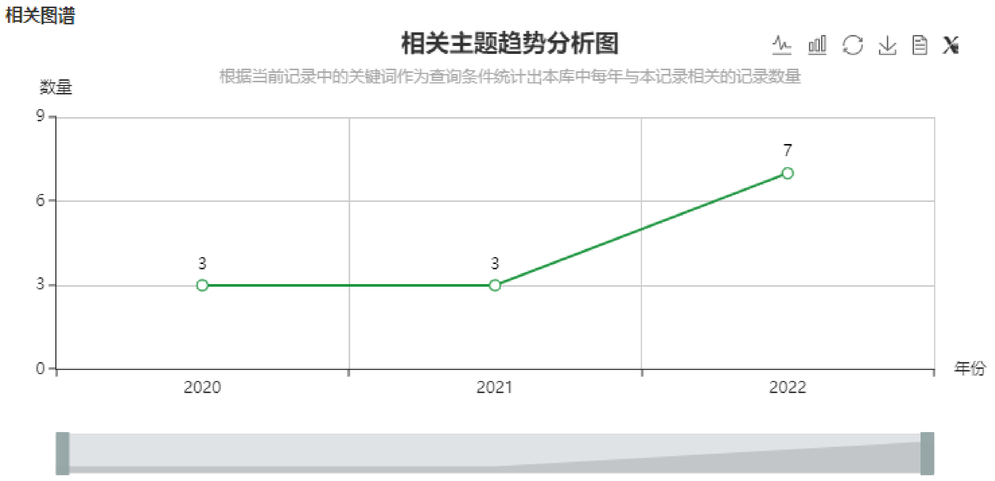
Bio-based epoxy vitrimer for recyclable and carbon fiber reinforced materials: Synthesis and structure-property relationship

编号	020035901
推送时间	20220905
研究领域	林产化工
年份	2022
类型	期刊
语种	英语
标题	Bio-based epoxy vitrimer for recyclable and carbon fiber reinforced materials: Synthesis and structure-property relationship
来源期刊	Composites Science and Technology
期	第359期
发表时间	20220818
关键词	Vitrimer; Epoxy-acid-anhydride system; CFRMs; Degradable; Recycling;
摘要	Recycling or degradation of epoxy resins is difficult because of their covalent cross-linking structures, which causes resource crisis, environmental pollution, and resource waste. To address this challenge, we reported a recyclable and degradable epoxy vitrimer with dynamic ester bonds prepared from tung oil and diglycidyl ether of bisphenol-A via epoxy-acid-anhydride crosslinking system. Owing to the compact rigid six-member ring and the anhydride structure, the epoxy vitrimer shows high thermal stability, and excellent dynamic mechanical, and mechanical properties with tensile strength of 59.21 +/- 1.02 MPa and glass transition temperature of 76.73 degrees C. The vitrimer network can achieve topological rearrangement via dynamic transesterification reactions with the addition of a Zn catalyst. Thus, the contrivable vitrimer exhibits excellent self-healing, shape memory, and physical recycling at elevated temperatures. Moreover, the epoxy vitrimer matrix has high joining strength with carbon fibers and can be used to prepare carbon-fiber-reinforced materials (CFRMs). The carbon fibers can be completely recycled from CFRMs through an ethanol-NaOH mixture solvent. This work can assist in preparation of degradable high-strength CFRMs using a recyclable tung-oil-based vitrimer matrix and provides a strategy for efficient recycling of carbon fibers from CFRMs.
服务人员	尚玮姣
服务院士	宋湛谦
PDF文件	浏览全文

相关记录 更多 >

- Fully rosin-based epoxy vitrimers with high mechanical and thermostability prope... 2022-12-12
- Thermal-induced self-healing bio-based vitrimers: Shape memory, recyclability, d... 2022-08-29
- Recyclable Thermoset Polymer Composites Based on Degradable and Dynamic C... 2022-09-12
- Recyclable, malleable and intrinsically flame-retardant epoxy resin with catalytic tr... 2022-05-30
- Recyclable and reformable epoxy resins based on dynamic covalent bonds – Pres... 2022-02-14
- Vitrimers based on bio-derived chemicals: Overview and future prospects 2022-02-07

相关图谱



相关主题

回用