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Option2

Synthesis and characterization of cardanol based eco-friendly flame-retardant adhesive for building construction

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Abstract: Herein, the cardanol-based flame retardant containing epoxide group to form the chemical bond with hydroxyl group in wood substrate was synthesized. It was confirmed that this cardanol based derivative can replace bisphenol A diglycidyl ether monomer in the epoxy-amine crosslinking reaction, and flame retardancy and adhesion property were investigated for the application of building construction.

Key words: cardanol, adhesive, flame retardant, building construction.

1. INTRODUCTION

Epoxy resin based on a bisphenol A diglycidyl ether monomer should be replaced by eco-friendly materials due to due to increasing the ecological awareness and human health concerns [1]. Therefore, we tried to synthesis new eco-friendly flame-retardant epoxy adhesive based on cardanol which was obtained from a facile thermal treatment of cashew nutshell is one example of a bio-based material [2].

2. Results

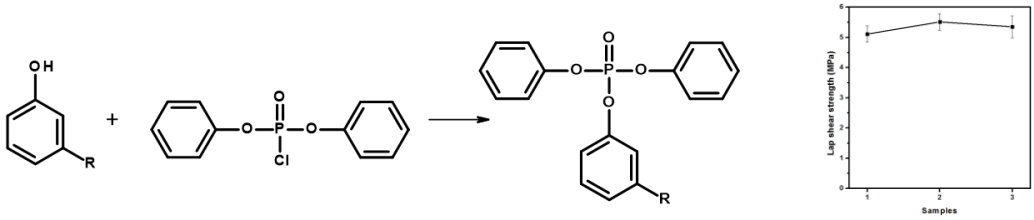

Figure 1. Synthetic scheme of cardanol based epoxy derivatives and adhesive property.

The bio-based flame retardant with phosphonate and epoxy group was synthesized via substitution reaction between cardanol and diphenyl phosphoryl chloride and subsequently epoxidation was carried out using hydrogen peroxide and formic acid. The adhesion property was increased as increasing the amount of cardanol based epoxy derivatives.

REFERENCES

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