Epoxidized Modification of Eucommia Ulmoides Gum

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Abstract: In this study, eucommia ulmoides gum (EUG) was modified by epoxidation in solution. The effect of reaction conditions on the epoxidation reaction was investigated. The influence of epoxidation content (*E*) on the melting and crystallization characteristics of epoxidized eucommia ulmoides gum (EEUG) was studied using infrared spectroscopy, nuclear magnetic resonance spectroscopy and differential scanning calorimetry methods. The experimental results showed that, when the reaction temperature increased and the amount of formic acid increased, the epoxidation content of EEUG increased. When the reaction temperature was 50 ˚C, the ratio of *n* (formic acid)∶*n* (double bond)∶*n* (hydrogen peroxide) was 0.8∶1∶1, the resulted epoxidation content of EEUG was high and there was no significant side reaction. It was found that the epoxidation reaction did not change the rubber molecular chain conformation, while the molecular chain of EEUG remained trans-1,4 structure. With the increase of epoxidation content, the crystallinity of EEUG decreased, and EEUG became an elastomer when the epoxidation content reached 24.8%.

Keywords: eucommia ulmoides gum; epoxidation; modification; epoxidation content; crystallization

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