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Rosin-derived poly(vinyl chloride) plasticizer: Synthesis, structure, and properties

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摘要	In this work, rosin-based plasticizer was synthesized by Diels–Alder (DA) and esterification. First, the maleopimaric acid (RT) was obtained by DA between the double bond of rosin and maleic anhydride. Then, the carboxyl group and anhydride group of RT was esterified with tetrahydro geraniol to obtain the rosin-based polyacid esters (RTT) under the catalysis of p-toluene sulfonic acid. The structure of RT and RTT was detected by FTIR and 1H-NMR. RTT was used as main plasticizer to obtain plasticized polyvinyl chloride (PVC) materials and compared with DOP. The results showed that RTT improved the thermal stability and reduced Tg of PVC film. Plasticized PVC films had excellent mechanical properties with the elastic modulus of 24,793.67MPa and tensile strength of 111.86MPa, higher than that of pure PVC and DOP-6. RTT showed better volatility stability, migration, and solvent extraction in PVC compared to DOP.
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