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Efficient utilization of peach gum to prepare UV-responsive peelable pressure-sensitive adhesives for non-destructive fabrication of ultrathin electronics

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摘要	Restricted by the poor solubility and complex structure, it remains a significant challenge to efficiently convert raw peach gum (RPG), a natural plant gum comprised of polysaccharides, into usable polymer materials. Herein, a novel approach is reported to prepare UV-responsive peelable pressure-sensitive adhesives (PSAs), which are mainly applied in the manufacturing of ultrathin electronics, through efficient utilization of RPG via prior dissolution using the N,N-dimethylacetamide/lithium chloride (DMAc/LiCl) solvent system and later degradation using H2O2 under UV light at room temperature. With sorbitol-based polyurethane acrylate (SPUA) as a UV-curable oligomer, rosin as a tackifier, and epoxidized soybean oil (ESO) as a plasticizer, before UV irradiation, the 180 degrees peel strength of the prepared PSAs reached 244.4 N/m. A short period of UV irradiation caused a formed cross-linked network structure inside the PSA and a disruption of the adhesive interface, resulting in a sharp decrease of 180 degrees peel strength to 7.3 N/m to achieve a non-destructive peeling of the adherend electronics from the carrier. This work provides a feasible strategy for efficiently utilizing natural peach gum to prepare bio-based UV-responsive peelable PSAs.
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