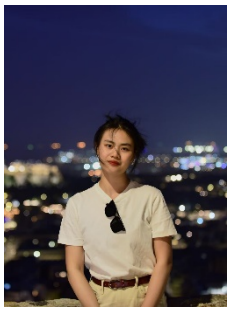

Sustainable Self-Healing Thermosetting Polymers from Renewable Carvone-Derived Diepoxides

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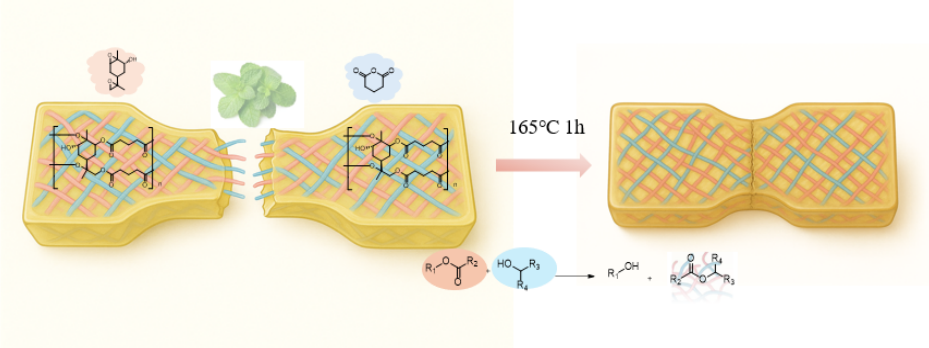
With the growing severity of global environmental issues and the depletion of fossil resources, the demand for clean fuels and green chemicals is rapidly increasing.[1] Monoterpenes represent a versatile class of renewable molecules, some of which possess promising potential as monomers for polymer synthesis.[2,3]

In this study, carvone[4,5] was utilized as a renewable precursor to synthesize and oxidize a series of diepoxide derivatives, which were subsequently cured with glutaric anhydride in the presence of imidazole to obtain four fully bio-based thermosets.[6]

Mechanical testing revealed that the hydroxyl-functionalized thermoset exhibited the best overall performance and, notably, demonstrated excellent self-healing ability without the need for additional catalysts. This work provides a sustainable route for developing renewable, self-healing epoxy thermosets derived from natural terpenes.



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