A NEW METHOD FOR CHEMICALLY RECYCLING DICYCLOPENTADIENE THERMOSETS

Tech ID: 34003 / UC Case 2025-119-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

The invention addresses the problem of recycling high-performance thermosets by developing a chemical process to deconstruct cycloolefin resins (CORs) that contain dicyclopentadiene (DCPD) crosslinkers. This process, developed by UC Berkeley researchers, uses a second-generation Hoveyda–Grubbs ruthenium(II) alkylidene catalyst for deconstruction via ring-closing metathesis. The method selectively reforms the cyclopentene ring in DCPD, allowing the resulting linear polyDCPD chains to be reused in new manufacturing cycles. This enables resin-to-resin circularity, with up to 84% of the linear DCPD being retrievable from end-of-life thermosets. The properties of the recycled material are comparable to the original, and the process works on various commercial and model CORs.

SUGGESTED USES

»
Creating a circular economy for high-performance thermosets.

»
Recycling of single-use products made from CORs.

»
Manufacturing new products from recycled DCPD materials.

»
Reducing waste and environmental impact from thermoset production.

ADVANTAGES

»
Enables resin-to-resin circularity for DCPD thermosets, which are typically difficult to recycle.

»
Achieves a high material recovery rate, with up to 84% of linear DCPD being retrievable.

»
Reproduces the properties of the original thermoset in subsequent generations of recycled material.

»
Provides a method for deconstructing various CORs, including copolymers.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

» **Biotechnology**
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» Other
» **Research Tools**
» Other

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