

Boroxine Based Dynamic Polymers

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BRIEF DESCRIPTION

Thermosets are a class of material that have high mechanical and physical strength. While traditional thermoset materials have favorable material properties, reprocessing and recycling them remains a challenge. Researchers at UCI have created dynamic boroxine polymers that crosslink to construct novel thermoset materials that are strong, highly malleable and recyclable.

FULL DESCRIPTION

Thermosets are a class of material that have high mechanical and physical strength and are used for a wide range of industrial applications such as automotive construction and electronics. Unfortunately, traditional covalent thermosets disfavors reprocessing and/or recycling methods at the end of their life cycle. It appears desirable to create highly malleable thermosets.

The researchers at the University of California, Irvine, have invented a class of thermoset material, constructed from boroxine that can undergo boroxine exchange to create a malleable polymeric network that is mechanically strong reprocessable and recyclable.

SUGGESTED USES

- Adhesives
- Insulation material
- Sealants
- Coatings
- Pipeline corrosion protection

ADVANTAGES

- Novel: The synthesis of dynamic boroxine as thermosets
- This class of material possesses high thermodynamic stability and kinetically tunable
- High Strength and malleable: Boroxine thermosets exhibit a remarkable combination of mechanical strength and high malleability.
- Reprocessable: Boroxine thermosets can be reprocessed
- Recyclable: Boroxine thermosets can be recycled to the original monomer

PATENT STATUS

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OTHER INFORMATION

CATEGORIZED AS

- » **Materials & Chemicals**
- » Chemicals
- » Other
- » Polymers

RELATED CASES

2018-833-0

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,370,889	06/28/2022	2018-833

STATE OF DEVELOPMENT

The inventors have successfully demonstrated the dynamic nature of the boroxine constructions. Future plans include expanding the design parameters by investigating different monomers.

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