Title: **Recent investigations into thermally reversible crosslinked polyolefins**

Main Author:

Name: Colin Li Pi Shan
Organization: Dow
Country: USA

Co-Authors:

Co-author 1: Hayley Brown
Organization: Dow
Country: USA
Co-author 2: Evelyn Auyeung
Organization: Dow
Country: USA
Co-author 3: Stephanie Barbon
Organization: Dow
Country: USA
Co-author 4: John Torkelson
Organization: Northwestern University, Chicago, IL
Country: USA
Co-author 5: Boran Chen
Organization: Northwestern University, Chicago, IL
Country: USA
Co-author 6: Logan Fenimore
Organization: Northwestern University, Chicago, IL
Country: USA

References:

Reference 1: *Fenimore, L.; Chen, B.; Torkelson, J.; J. Mater. Chem. A*, 2022,10, 24726-24745
Reference 2:
Reference 3:
Reference 4:
Reference 5:
Reference 6:
Reference 7:
Reference 8:
Reference 9:
Reference 10:
Reference 11:
Reference 12:

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Abstract:

Cross-linked polyolefin polymers traditionally used for long-term, high durability applications are difficult to recycle and challenged when it comes to sustainable end-of-life solutions.

Recent investigations into the development of thermally reversible crosslinked polyolefins have led to several characterization challenges in defining its "reversibility". Through the investigation of new chemistries such as the one proposed by Torkelson et al., polyolefins can be simply modified via melt-state grafting of novel reagents (such as dynamic dialkylamino disulfide (BiTEMPS) chemistry) into dynamic covalent adaptive networks (CAN)[1]. At the right processing conditions, the dynamic crosslinks in the polyolefin CANs can disassociate and result in reprocessing followed by recovery of the networks.

Characterization of this reversible network behavior via spectroscopic, thermal, or rheological means has proposed new challenges in the understanding. The following presentation will overview the development of these polyolefin CAN's and the testing and analysis undertaken to demonstrate the reversibility of the dynamic crosslinks from melt reprocessing studies.