

In Person
Departmental
Colloquium



Prof. Ica Manas-Zloczower

Department of Macromolecular Science and Engineering
Case Western Reserve University, Cleveland, OH

**Vitrimerization: A Novel
Concept to Recycle Thermoset
Waste via Dynamic Chemistry**

Wednesday
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1:00 – 2:00 p.m.

Join Us

Old Engineering Building
Room 301
West Campus

Vitrimerization: A Novel Concept to Recycle Thermoset Waste via Dynamic Chemistry

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Abstract

Vitrimerization is a newly developed concept to convert permanent crosslinked thermoset networks into vitrimer type dynamic networks via a simple, one-step method without depolymerization. Vitrimerization relies on designing a strategy to induce re-formability and healing in permanent chemically crosslinked polymer networks by using exchangeable chemical bonds that will lead to dynamic crosslinked networks. Key to the success of the strategy is establishing a process whereby exchange catalysts transform waste thermoset polymers into recyclable vitrimers. The vitrimerization approach is a low-cost, eco-friendly and scalable method that can be effectively implemented to address current challenges in recycling thermoset polymers. Moreover, the recycled thermosets can be used in combination with various nanofillers to manufacture nanocomposites with tailored properties. This simple and practical concept of recycling thermoset polymers without depolymerization provides a new strategy toward elimination of thermoset waste.

Biosketch

Ica Manas-Zloczower is the Thomas W. and Nancy P. Seitz Professor of Advanced Materials and Energy in the Department of Macromolecular Science and Engineering and the Distinguished University Professor at Case Western Reserve University. She received BS and MS degrees in Chemical Engineering from Polytechnic Institute Jassy, Romania and a DSc in Chemical Engineering from the Technion-Israel Institute of Technology. She was a post-doctoral fellow at the University of Minnesota. Prof. Manas-Zloczower is the recipient of the 2017 SPE Fred E. Schwab Education Award and the 2012 George S. Whitby Award for Distinguished Teaching and Research awarded by American Chemical Society Rubber Division. She was elected and served as the President of the International Polymer Processing Society in 2011-2013. She is also a fellow of the Society of Plastics Engineers and was elected to the Board of Directors of Extrusion Division of the Society of Plastics Engineers in May 2000. She was the Editor-in-Chief of the Journal of Polymer Engineering 1999-2014 and serves on the Book Advisory Board for Hanser publisher. Prof. Manas-Zloczower's research accomplishments have been recognized through more than 90 plenary, keynote and invited lectures at national and international conferences and more than 100 invited seminars at various companies and universities worldwide. She has also chaired several sessions at national and international meetings. She presented the 2014 and 2017 Plenary Technical Lecture for the Society of Plastics Engineers. She has advised 36 PhD students, 30 MS students, 18 post-docs, 4 PhD exchange students and many of undergraduate students. Prof. Manas-Zloczower has more than 220 publications in peer-reviewed journals, more than 100 published conference proceedings, and a number of book chapters and patents. She is the editor of the 2009 book "Mixing and Compounding of Polymers" published by Hanser.