



IBS Center for Multidimensional Carbon Materials



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Bio-Based Shape Memory Polymers Fabricated from Vanillin-Furfurylamine-Containing Benzoxazine/Epoxidized Castor Oil Copolymers

JUNE 9 (SUN) | Bldg. 101
14:00 | Seminar Room on the 1st floor

In this research, intelligent polymeric materials possessing shape memory effects were developed from renewable resources. Bio-based benzoxazine resins were prepared from Mannich-like condensation of vanillin or eugenol, furfurylamine, and paraformaldehyde utilizing the solventless approach. Vanillin-furfurylamine-containing polybenzoxazine (poly(V-fa)) and eugenol-furfurylamine-containing polybenzoxazine (poly(E-fa)) exhibited good thermal properties and flame retardant properties. V-fa monomer could be copolymerized with epoxidized castor oil (ECO). The resulting copolymer could be deformed to a temporary shape and subsequently recovered to the original shape after exposing to thermal heating at 120°C. V-fa/ECO copolymer showed good shape memory performances with shape fixity of 98%, shape recovery ratio of 100%, and fast recovery time of 250 seconds under the bending load.

Keywords: Polybenzoxazine, Bio-based polymer, Shape memory polymer, Epoxidized castor oil.

Dr. Sarawut Rimdusit is a full professor of the Department of Chemical Engineering, Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand. He received his master and doctoral degrees from the Department of Macromolecular Science and Engineering, Case Western Reserve University, Cleveland, Ohio, USA in 1997 and 2000, respectively. He worked as a post-doctoral fellow under a Hitachi research fellowship in 2005 and 2008 at Toyohashi University and Technology and Monbusho research fellowship in 2003 at the Japan Aerospace Exploration Agency (JAXA, formerly ISAS). His research is concentrated on multicomponent polymeric systems based on polybenzoxazines and some network forming polymers. His recent research focuses on the use of polybenzoxazine alloys as functional materials including shape memory materials and thermoreversible light scattering polymers. He has published 1 book on polybenzoxazine alloys and composites (Springer), 10 book chapters in English, 4 book chapters in Japanese and more than 70 international papers related to the alloys and composites of polybenzoxazines.

You are cordially invited to attend!

Special Seminar