



Mechanical Engineering Seminar Series

Tanglemer: A Polymer Network in which Entanglements Greatly Outnumber Crosslinks

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Abstract

Long polymers inevitably entangle, and do not detangle in a crosslinked network. It is known that the network is stiffened by both crosslinks and entanglements. We have recently discovered that crosslinks and entanglements act differently when the network fractures. At a crack tip, crosslinks concentrate stress, but entanglements deconcentrate stress. The deconcentration of stress leads to high toughness, strength, and fatigue resistance. This talk describes methods to synthesize tanglemer, polymer networks in which entanglements greatly outnumber crosslinks. Tanglemer extend polymer durability and hold promise to reduce polymer pollution.

Bio

Zhigang Suo is Allen E. and Marilyn M. Puckett Professor of Mechanics and Materials at Harvard University. He earned a bachelor's degree from Xi'an Jiaotong University in 1985, and a Ph.D. degree from Harvard University in 1989. Suo joined the faculty of the University of California at Santa Barbara in 1989, Princeton University in 1997, and Harvard University in 2003. His research centers on the mechanical behavior of materials.

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