MAR17-2016-020296

Abstract for an Invited Paper
for the MAR17 Meeting of
the American Physical Society

Mechanical behavior of hydrogels

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Several recent findings show that hydrogels can achieve properties and applications well beyond previously imagined. Most existing hydrogels, like Jell-O and tofu, are fragile and dry out in open air. We have made hydrogels as tough as rubber, and retain water in low-humidity environment. We have used hydrogels to develop devices to mimic the function of axons, nerves, and skins. They are highly stretchable and transparent. This talk describes the mechanical behavior of hydrogels. Emphasis will be given to recent work on adhesion, fatigue resistance, and flaw tolerance.