화학과 세미나

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Smart Soft Materials with Multiscale Architecture and Dynamic Surface Topographies

Smart soft materials can dramatically change their properties in response to external stimuli such as light, moisture, mechanical force, temperature, electric or magnetic fields, and pH. Inspired by adaptive strategies in animals and plants, we have developed a series of smart soft material devices that respond instantly and reversibly through optical, electrical, mechanical, and shape-morphing signals. These systems enable diverse applications, including smart windows, information encryption, thermal camouflage, wearable strain sensing, anticounterfeiting, and human–machine interfaces. Their performance is driven by function-oriented structural design, combining bioinspiration and surface engineering with multiscale architectures such as dynamic cracks, folds, and stimuli-responsive wrinkles.

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