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Multi-material stimuli-responsive hydrogels with optically induced actuation

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Meeting abstract. No PDF available.

ABSTRACT

A vision for soft, autonomous materials entails synthesis of multiple senses in multifunctional materials where material response requires sensitivity to external stimuli. Stimuli-responsive hydrogels are of particular interest for optically induced mechanical response due to the ability to transform external stimuli into large, reversible shape change. Specifically, temperature-responsive hydrogels are broadly used and can be designed to achieve deformation through the photothermal effect as a result of surface plasmonic resonance of gold nanoparticles. Here, a multi-material stimuli-responsive hydrogel network with embedded gold nanoparticles is demonstrated in a unit cell pattern with anisotropic swelling behavior in response to visible light. Reversible, anisotropic swelling leads to bending motion that contributes to the development of soft, autonomous materials.

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