Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Dual-responsive soft actuators based on self-assembled polymers SEUNG JAE KIM, MOON JEONG PARK, Pohang Univ of Sci Tech — Electroactive polymer actuators (EAPs) have been extensively studied for biomimetic technologies such as artificial muscles and soft robotics. While a large deformation can be achievable from EAPs under relatively low-driving voltages, the slow response time has long been a fundamental drawback of EAPs. Here, we investigate a new soft actuator capable of responding two different external stimuli. The actuator is composed of electroactive polymer and light-responsive polymer. We have employed ionic block copolymers having well-connected ion-conduction channels to raise response to electric-field. Light-responsive polymers were additionally incorporated into them to control the deformation of the actuator in an independent manner. Noteworthy observation in the present study is that the dual-responsive polymers resulted in synergetic achievement of high bending strain and fast response time, which marked a significant improvement from the conventional EAPs.

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Date submitted: 15 Mar 2017 Electronic form version 1.4