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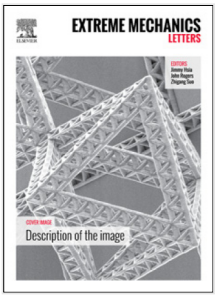

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Zhijian Wang, Wei Fan, Qiguang He, Yang Wang, Xudong Liang, Shengqiang Cai

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A simple and robust way towards reversible mechanochromism: using liquid crystal elastomer as a mask

Zhijian Wang[1)], Wei Fan[2)], Qiguang He[1)], Yang Wang[3)], Xudong Liang[1)], Shengqiang Cai[1,2)*]

[1] *Department of Mechanical and Aerospace Engineering, University of California, San Diego, La Jolla, CA 92093, USA*

[2] *Materials Science and Engineering Program, University of California, San Diego, La Jolla, CA 92093, USA*

[3] *Department of Structural Engineering, University of California, San Diego, La Jolla, CA 92093, USA*

Abstract

Mechanochromism is color change of a material induced by external force. Recently, it has been intensively studied for its potential applications in biomimetic camouflage devices and strain sensors. In this article, we developed a simple and robust way to fabricate reversible mechanochromic trilayer system using liquid crystal elastomer (LCE) and transparent elastomers. Subjected to mechanical stretch, an opaque polydomain LCE can transform to transparent monodomain, which is used as a mask to block (without stretch) or show (with stretch) the color patterns painted on an elastomeric layer attached underneath. In this article we also demonstrated the visualization of heterogeneous strain field in the developed mechanochromic system.

* Corresponding author

E-mail: shqcai@ucsd.edu (Shengqiang Cai)