

Accepted Manuscript

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PII: S0167-577X(17)30546-3
DOI: <http://dx.doi.org/10.1016/j.matlet.2017.04.009>
Reference: MLBLUE 22430

To appear in: *Materials Letters*

Received Date: 26 December 2016
Revised Date: 10 March 2017
Accepted Date: 2 April 2017

Please cite this article as: H. Wang, H. Luo, X. Zhou, Y. Lin, G. Zhao, G. Yi, X. Cheng, H. Wang, J. Li, Conductive multi-shape polymer composites towards stimuli sensing, *Materials Letters* (2017), doi: <http://dx.doi.org/10.1016/j.matlet.2017.04.009>

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Conductive multi-shape polymer composites towards stimuli sensing

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Abstract

Electrically conductive polymer composites were exploited to response stimuli based on multi-shape memory effect. Silver nanowires (AgNWs) network was embedded into a shape memory polymer blend possessing two discrete melting transition temperatures. The composites exhibited sequential triple shape recovery behaviors under the heat stimulation. Electro-mechanical measurements disclosed that the conduction varied along with the shape changes. Particularly, the influence of the compositions and stretching percentages on the electric/shape recovery was disclosed.

The underlying morphology and microstructure evolutions were investigated. It is unprecedented to achieve the different temperatures sensing by one conductive polymer composite. The findings may greatly benefit the intelligent polymers in the multi-functional flexible electronics.

Key words: conductive; shape memory materials; triple shape; stimuli sensing;

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