

Supporting information

Stress memory for visualization detection of complicated mechanical structures via trap structure manipulation

Zhichao Liu,^a Xue Yu,^{*b} Lei Zhao,^c Haitao Tang,^a Zhaofeng Wang,^d Xiaodie Zhu,^a Xiuxia Yang,^a Feng Zhao,^b Jianbei Qiu^a and Xuhui Xu^{*a}

^a College of Materials Science and Engineering, Kunming University of Science and Technology, Kunming 650093,

P. R. China

^b School of Mechanical Engineering, Institute for Advanced Materials, Chengdu University, Chengdu 610059, P.

R. China

^c School of Physics and Opto-Electronic Technology, Baoji University of Arts and Sciences, Baoji 721016, Shaanxi,

P. R. China

^d State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences,

Lanzhou 730000, P. R. China.

Corresponding Author: Xuhui Xu E-mails: xuxuh07@126.com

Xue Yu E-mails: yuyu6593@126.com

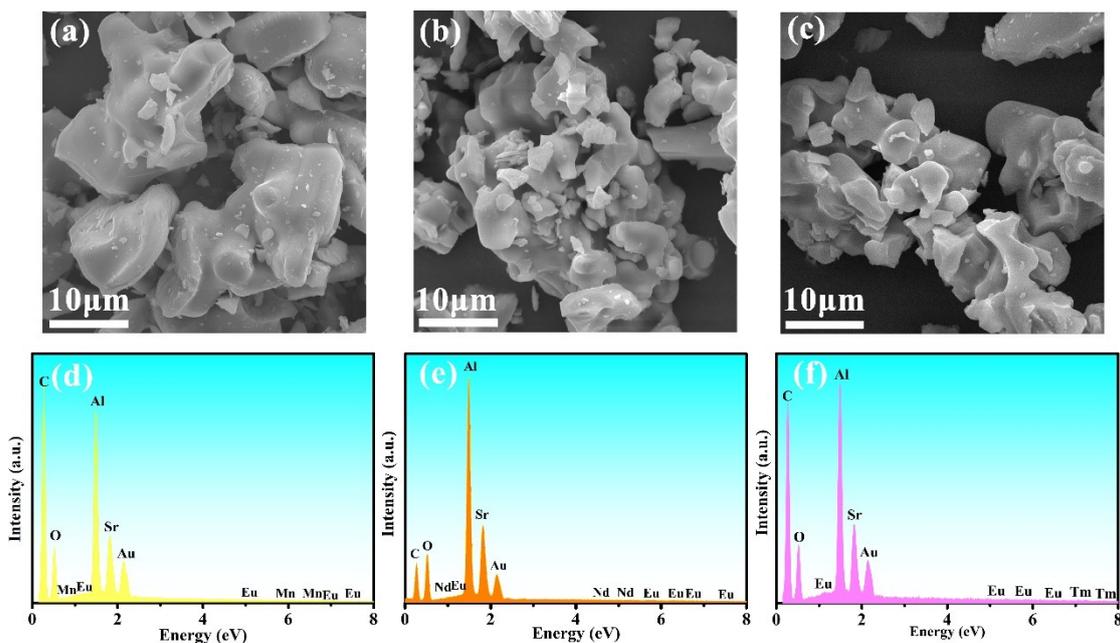


Fig. S1 SEM of (a) SAOEM (b) SAOEN (c) SAOET; EDS pattern of the (d)SAOEM (e) SAOEN

(f) SAOET. The characteristic peak of Au is derived from the sample support platform.

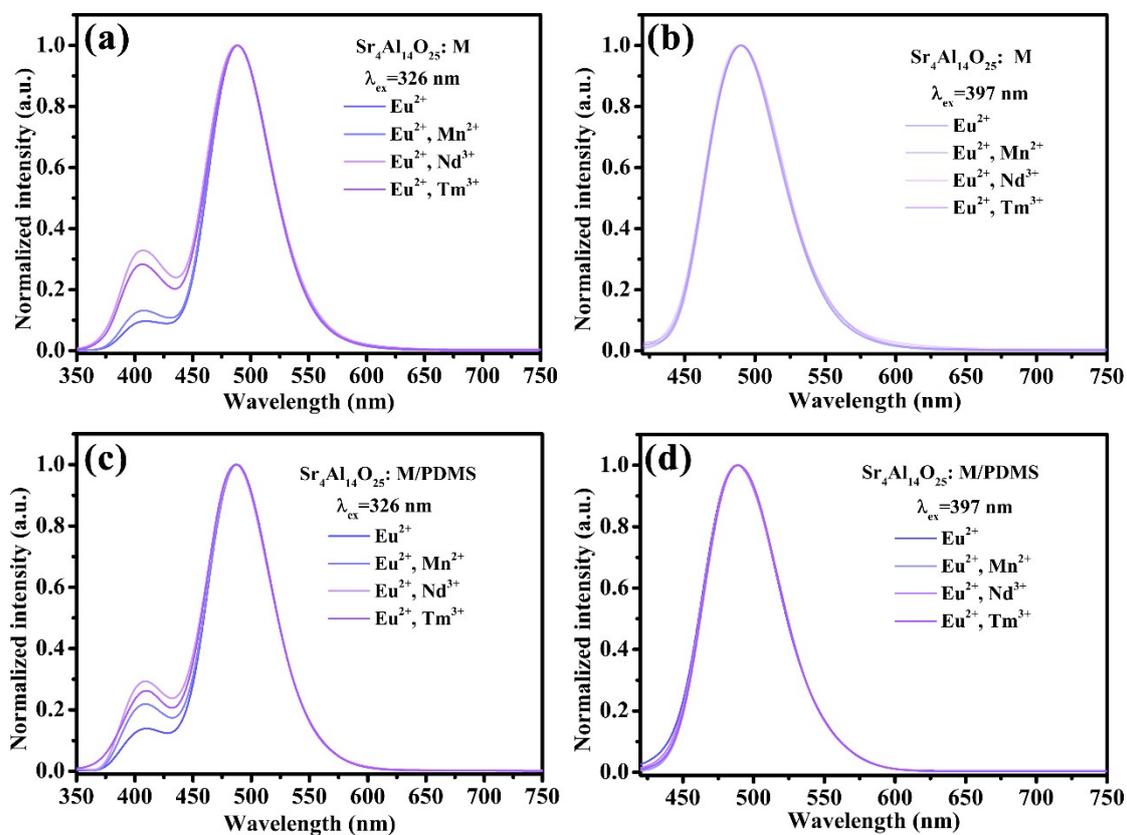


Fig. S2 Normalized PL spectra of SAOE/ SAOEM/SAOEN/SAOET before and after compositing PDMS; (b) (d) $\lambda_{\text{ex}}=397$ nm.

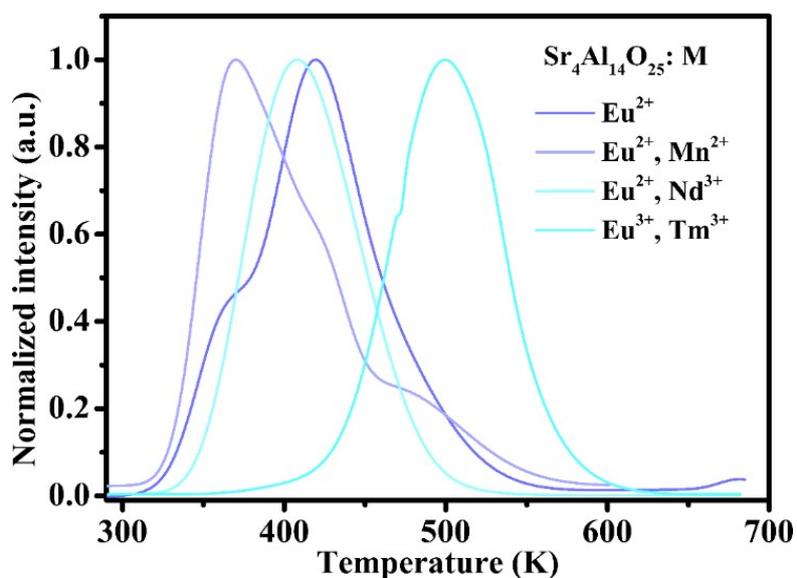


Fig. S3 TL curves of SAOE/SAOEM/SAOEN/SAOET.

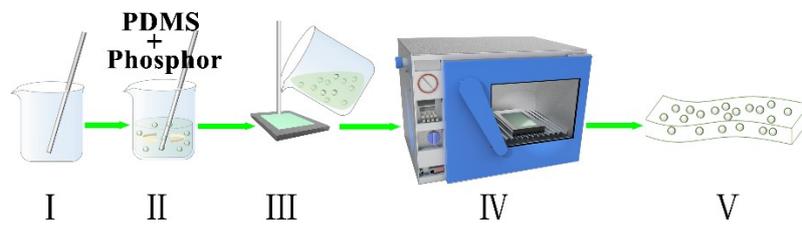


Fig. S4 Fabrication process for the phosphors/PDMS elastomer.

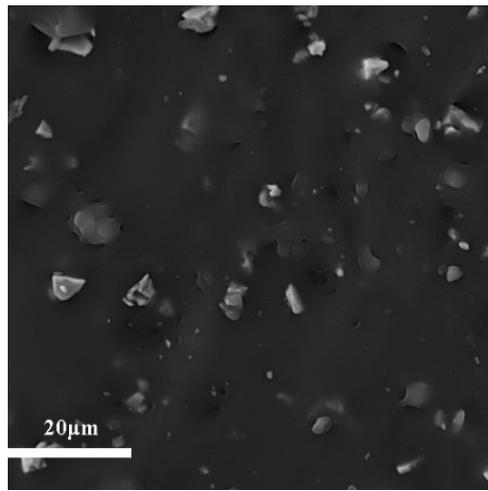


Fig. S5 SEM images of the as-fabricated SAOET/PDMS elastomer high magnification (scale bar: 20 μm).

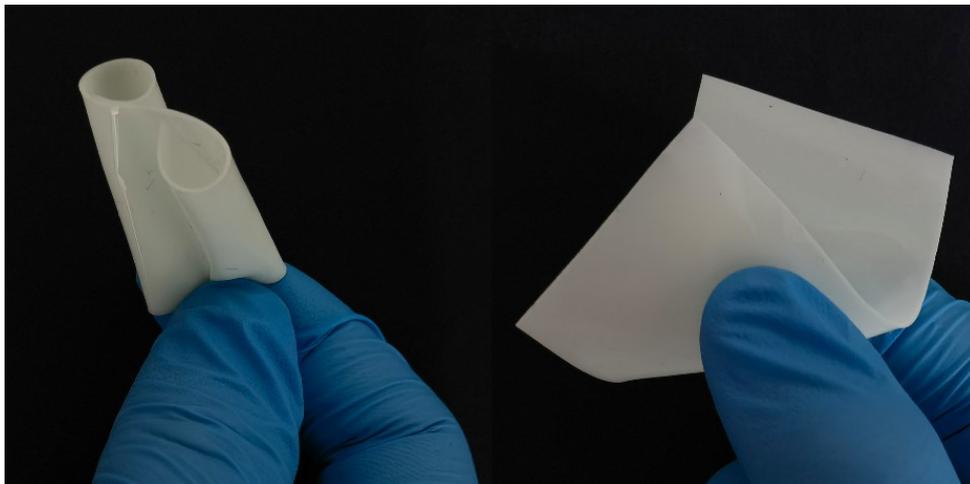


Fig. S6 Softness of the SAOET/PDMS elastomer.

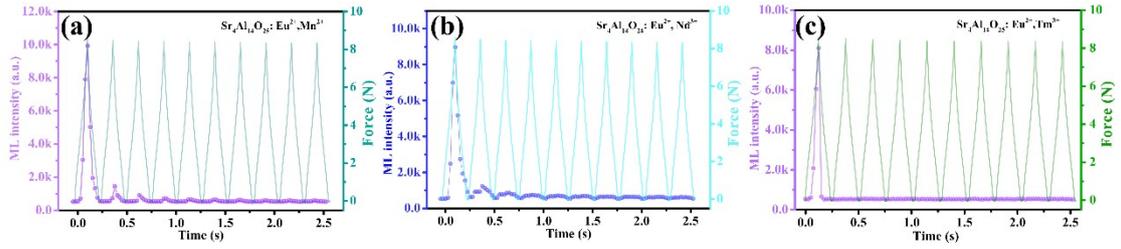


Fig. S7 ML decay behavior of (a) SAOEM/PDMS (b) SAOEN/PDMS (c) SAOET/PDMS under the consecutive stretching-releasing for 10 cycles.

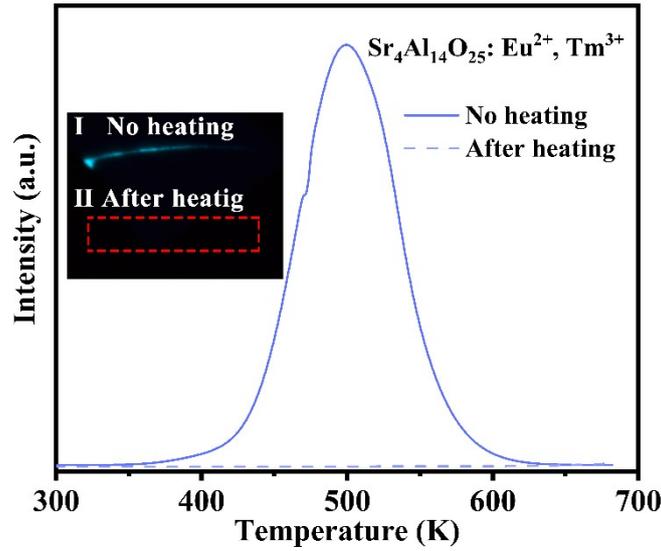


Fig. S8 TL curves of SAOET film after heating and no heating; inset shows the ML properties of SAOET after heating and no heating.

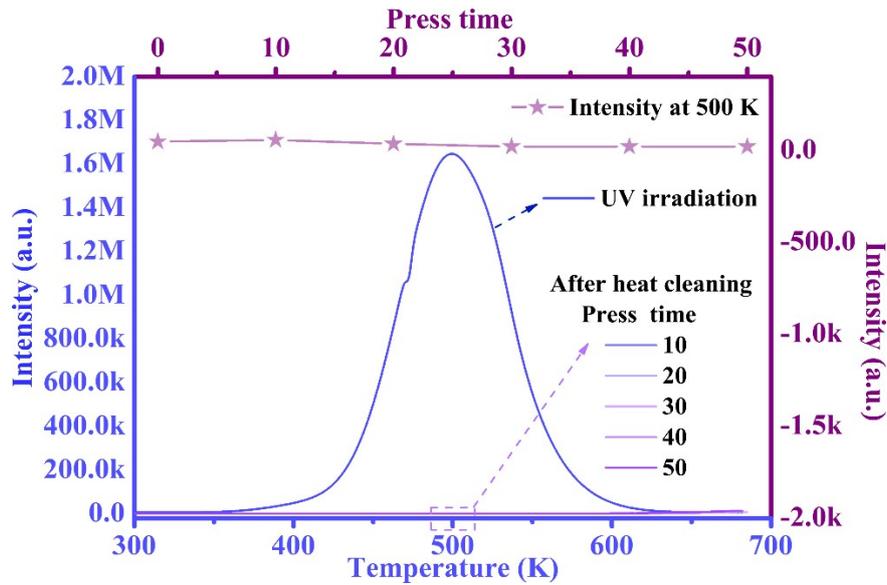


Fig. S9 TL curves of SAOET film in different press times after heat cleaning and after UV irradiated 15 min. The line with an asterisk in the inset shows the intensity of SAOET film at 500 K in different press times after heat cleaning.

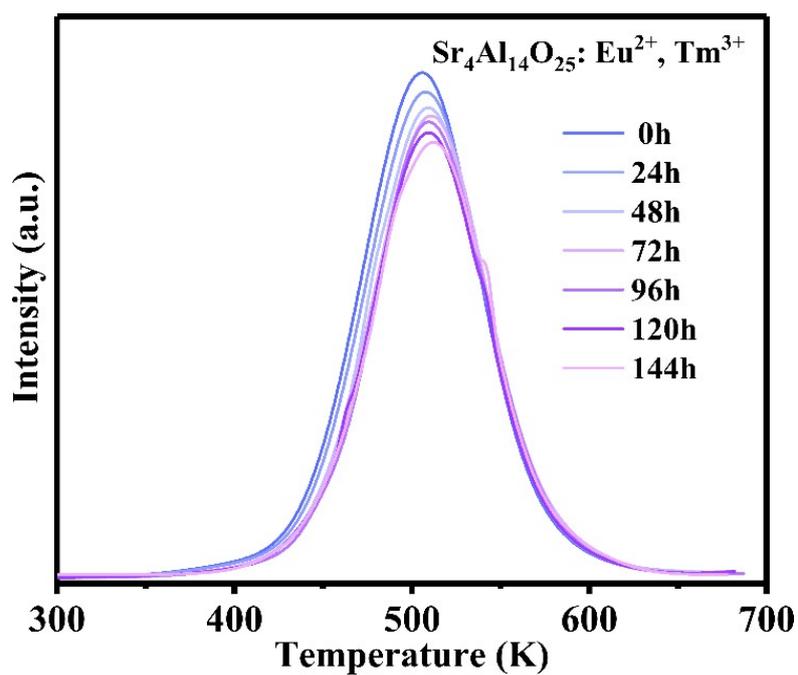


Fig. S10 Time-dependent TL curves of SAOET.

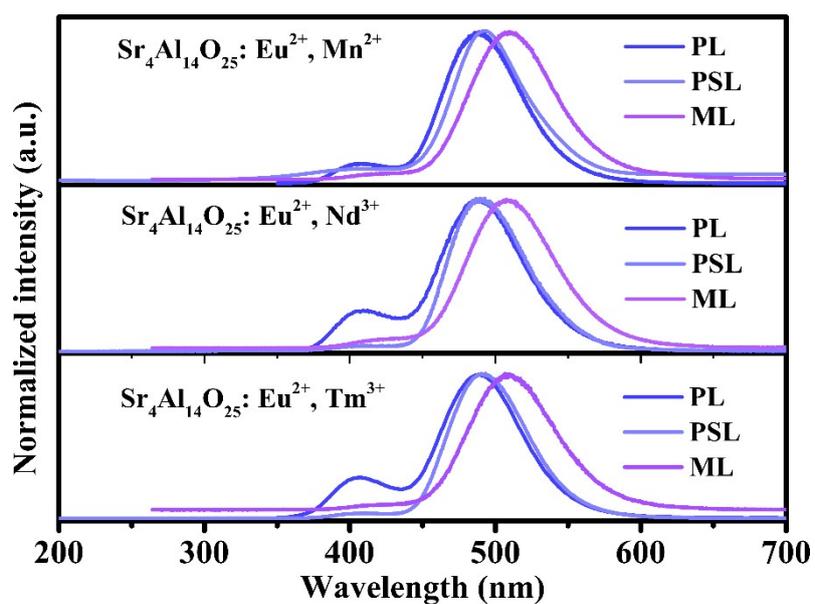


Fig. S11 Comparison of SAOEM, SAOEN, and SAOET/ PDMS of PL, PSL, ML spectra.

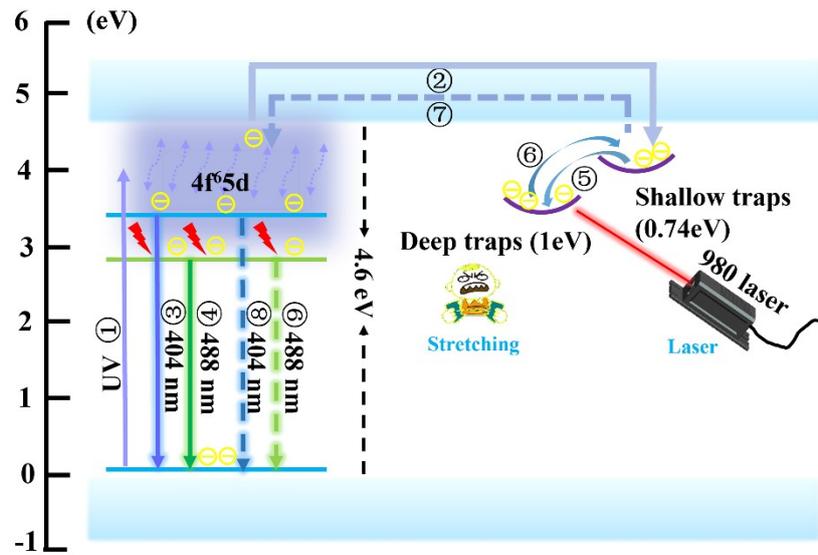


Fig. S12 Mechanism graphic of SAOEM, SAOEN and SAOET/ PDMS under laser and load.