

## Electronic Supporting Information

### Photothermal Solid-to-Liquid Transition in A Coordination Polymer: Strength Enhanced by Coordination Bond-Induced Nanoconfinement

Yan Zhai,<sup>a, b</sup> Mengxiao Lv,<sup>a, b</sup> Fei Shan,<sup>a, b</sup> Tao Qi,<sup>b</sup> Siwen Cui,<sup>\*c</sup> Hao Lan<sup>\*a, b</sup> and  
Jun-Peng Wang<sup>\*a, b</sup>

<sup>a</sup> School of Rare earths, University of Science and Technology of China, Hefei 230026, China

<sup>b</sup> Ganjiang Innovation Academy, Chinese Academy of Sciences, Ganzhou 341000, China

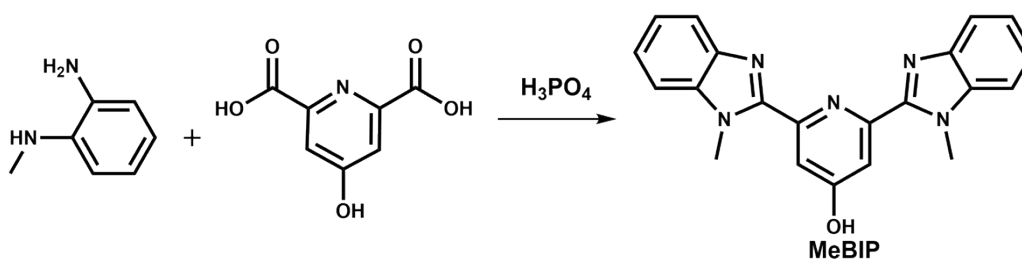
<sup>c</sup> Center for Advanced Materials Research, Zhongyuan University of Technology, Zhengzhou 450007, China.

\*Corresponding authors E-mails: wangjunpeng@gia.cas.cn; hlan@gia.cas.cn; cuiuwen@zut.edu.cn

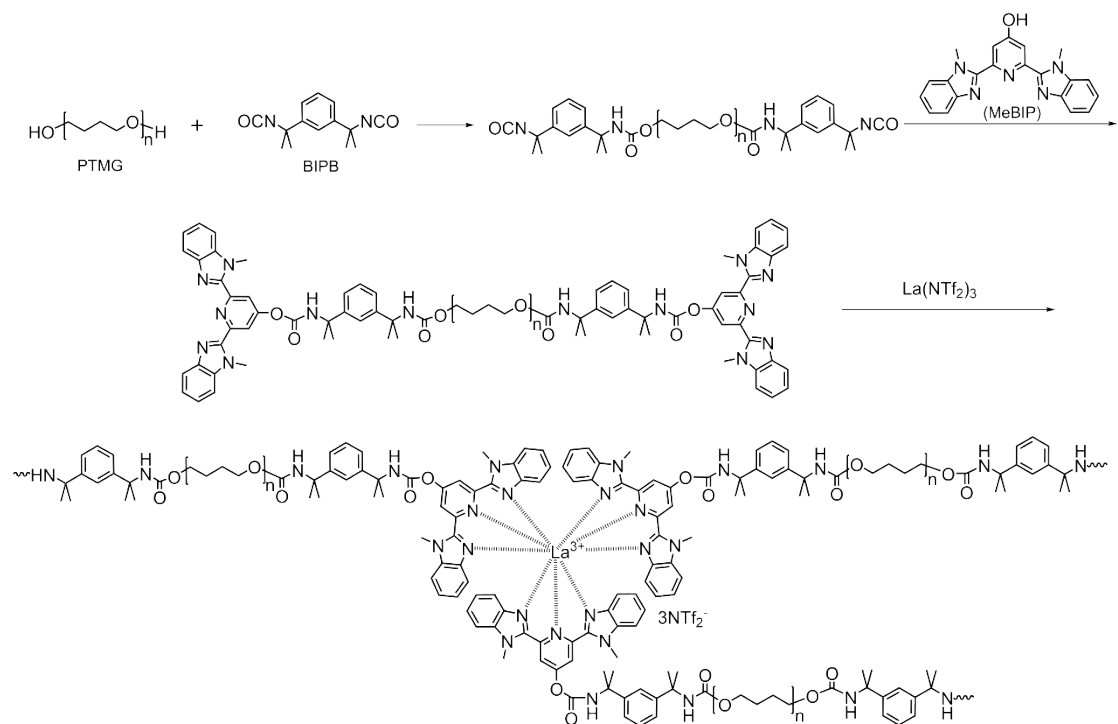
**Keywords:** photothermal solid-to-liquid transition, coordination polymer, enhanced strength, coordination bond-induced nanoconfinement



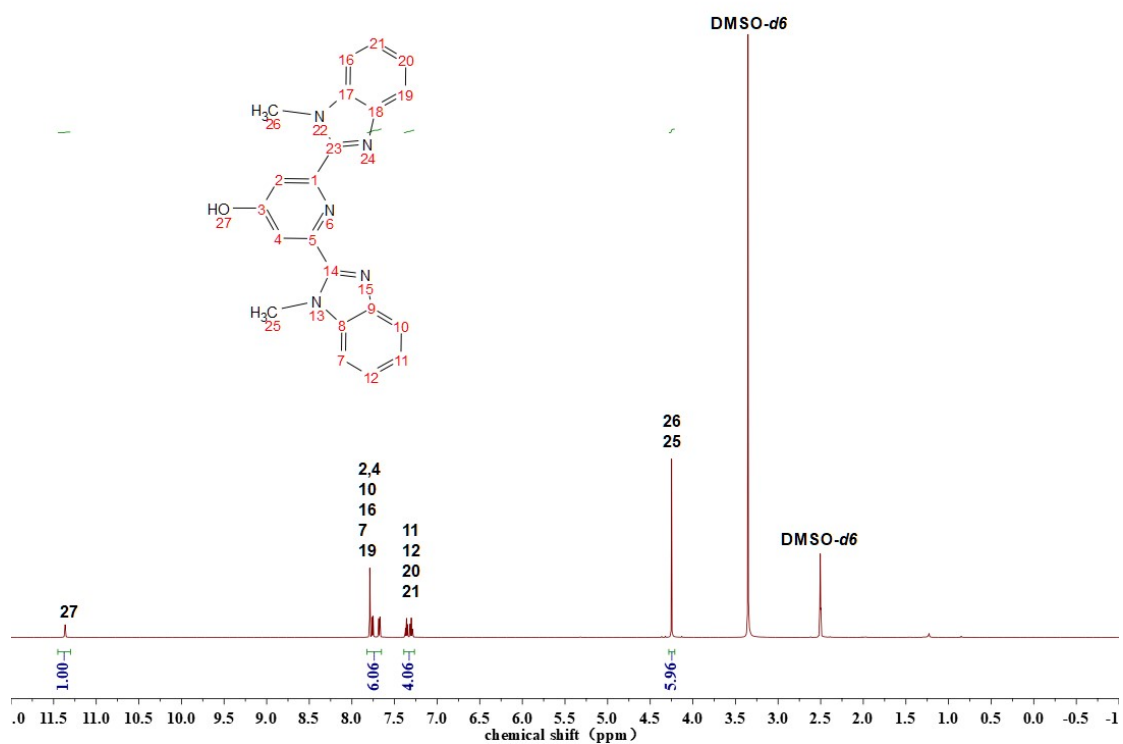
**Figure S1.** The light intensity of a 365 nm light source under experimental conditions.



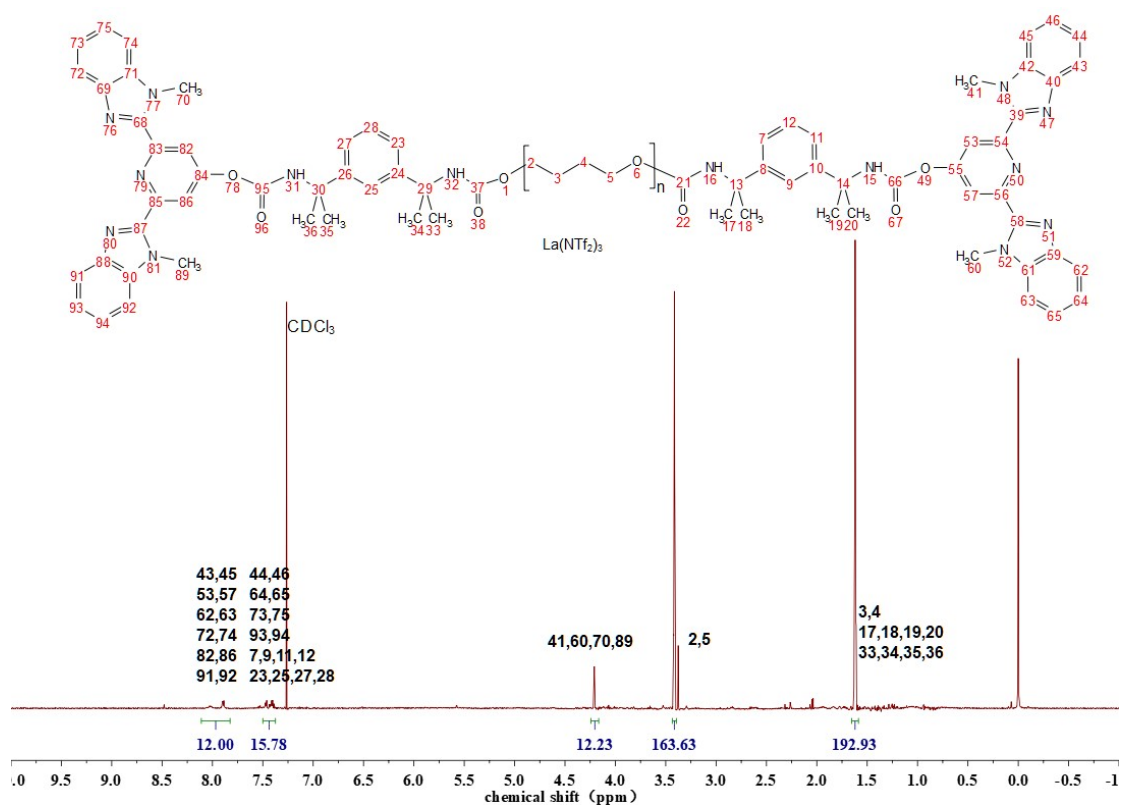
**Figure S2.** Schematic diagram of the synthesis route of MeBIP ligand.



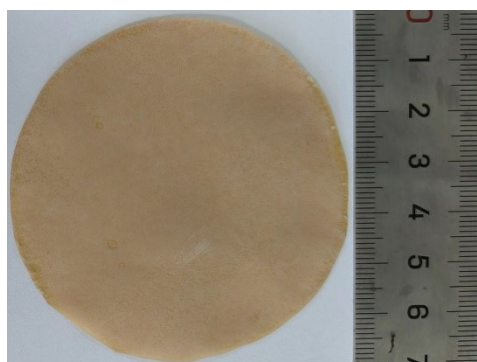
**Figure S3.** Schematic diagram of the synthesis route of PSLTP polymer.



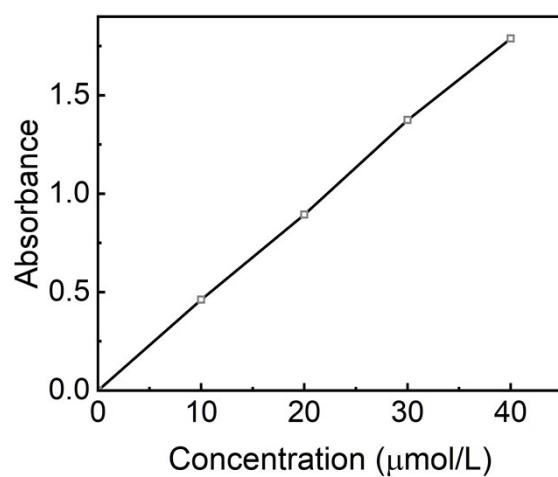
**Figure S4.** The  $^1\text{H}$  NMR of MeBIP ligand.



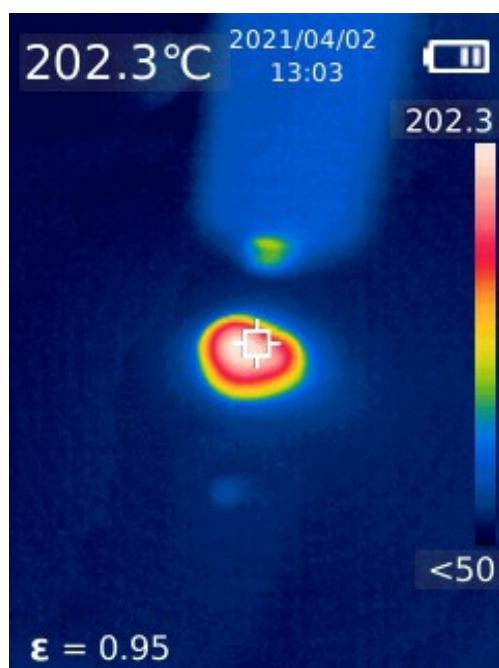
**Figure S5.** <sup>1</sup>H NMR spectra of PSLTP synthesized from PTMG ( $M_n=2900$ ) as raw material.



**Figure S6.** Image of PSLTP polymer synthesized from PTMG ( $M_n=2900$ ) as raw material.



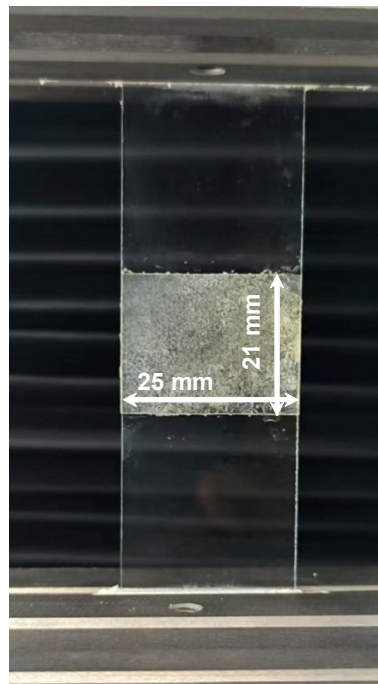
**Figure S7.** The standard curve of MeBIP in CHCl<sub>3</sub>.



**Figure S8.** Surface temperature distribution of PSLTP under 365 nm light irradiation for 30 s.



**Figure S9.** The stretching image of PSLTP.



**Figure S10.** Picture of the test sample when PSLTP is used as a detachable adhesive.



**Figure S11.** Image of PSLTP as a detachable adhesive after lap shear experiment.

**VideoS1:** Photoinduced solid-to-liquid transition of PSLTP polymer under 365 nm irradiation.

**VideoS2:** Photoinduced phase transition of PSLTP polymer on the surface of PTFE.