

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: **Photoinduced spatiotemporal gel-to-gel transition of TiNS-Gel.**

Changes in polarized optical microscopic images under crossed Nicols of TiNS-Gel doped with AuNP as a photothermal converter ([TiNS] = 14 wt%; [AuNP] = 0.05 wt%), which was filled in a 0.2-mm-thick glass container. When TiNS-Gel_{Repuls} was irradiated with the 445-nm laser light (power density = 5.6 W cm^{-2} ; irradiated region = $2 \times 4 \text{ mm}$) for 40 s, the irradiated region was selectively transformed into TiNS-Gel_{Attract} with no birefringence. Upon ceasing photoirradiation, the irradiated region was air-cooled and returned to TiNS-Gel_{Repuls} with a large birefringence within 4 s. This cycle could be repeated many times without deterioration.