Supporting Information

Ultra-Strong and Fast Response Gel by Solvent Exchange and Its Shape Memory Applications

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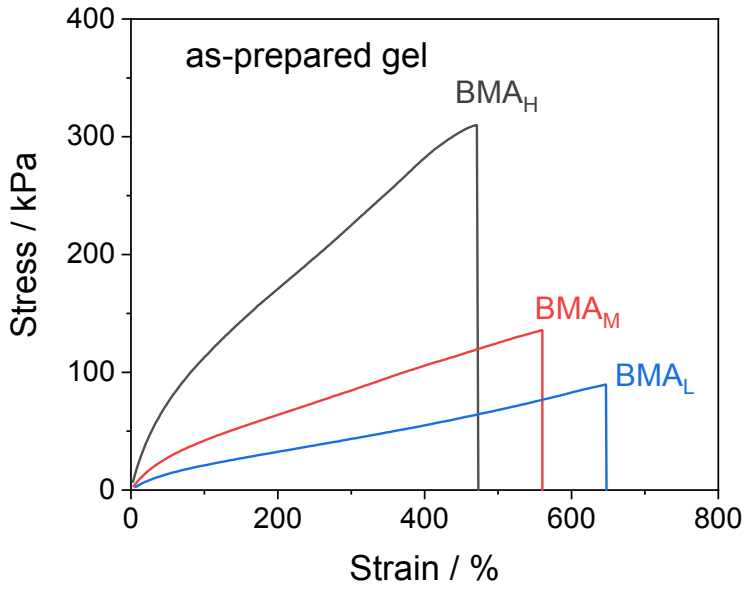

Figure S1. Stress-strain curves of the as-prepared gels with different BMA contents.

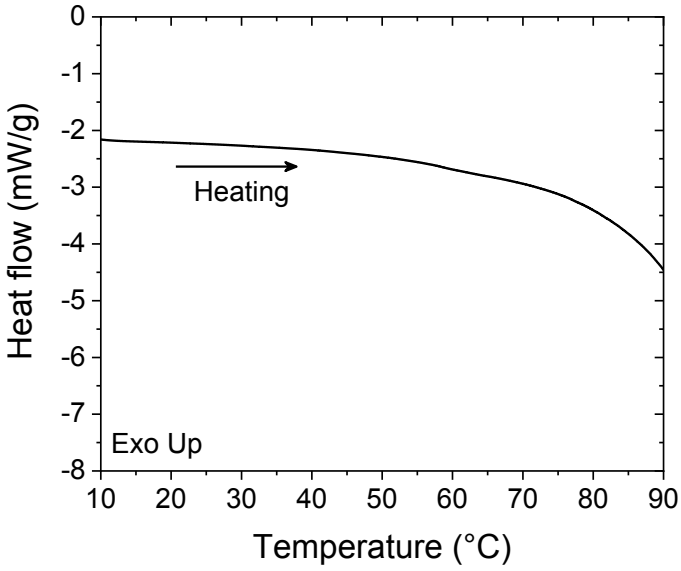

Figure S2. DSC thermogram of the BAM$_H$-7d gel. The gel sample was sealed in an aluminum DSC pan and scanned under a nitrogen atmosphere from 10 to 90 °C on the TA DSC Q20 instrument at a heating rate of 5 °C/min.

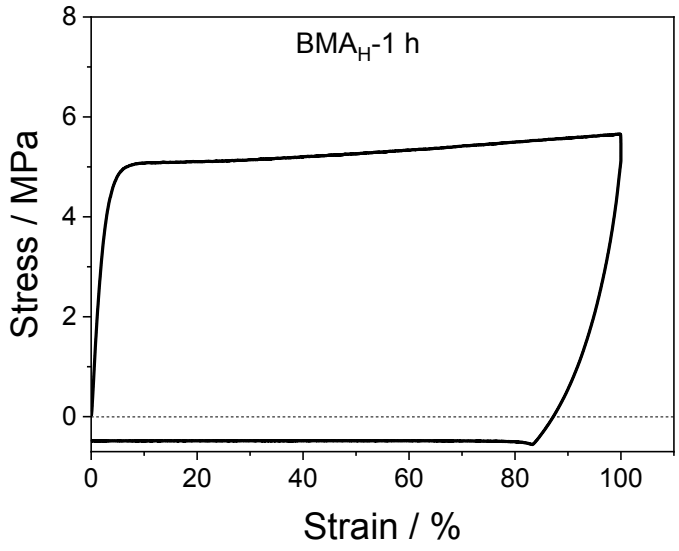

Figure S3. Tensile loading-unloading stress-strain curves of BMA$_H$-1 h gel. The hysteresis percentage of the 1st cycle is ~80%.

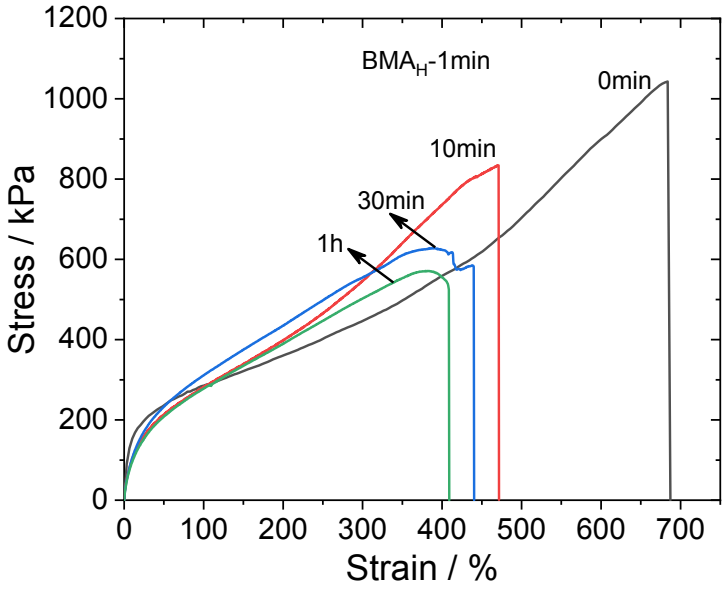

Figure S4. Stress–strain curves of the BAM$_H$-1min gel with different waiting time.

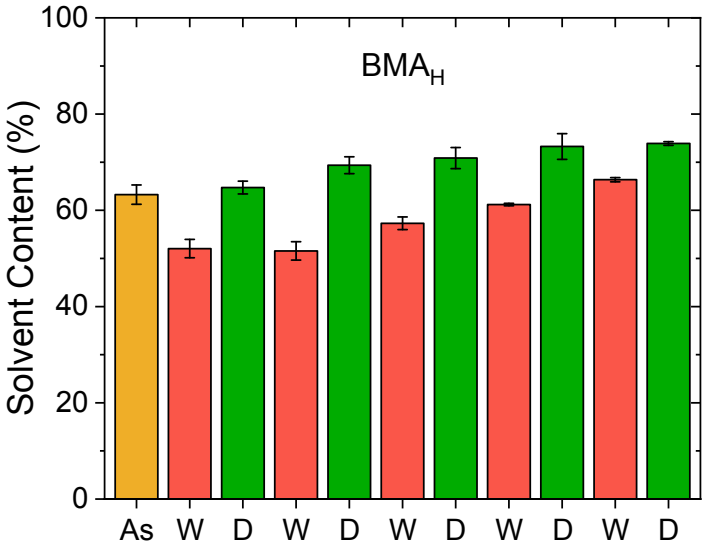

Figure S5. Solvent content in BAM_H gel during alternating immersion in H_2O (W) for 1 min and in DMSO (D) for 4 min compared with that of the as-prepared gel (As).

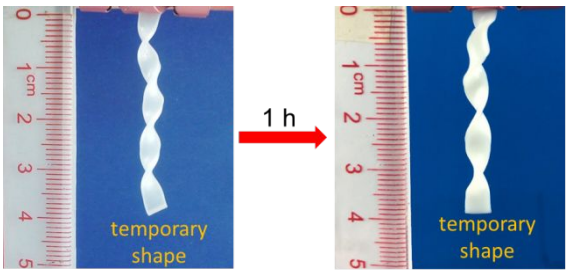

Figure S6. The stability test of the temporary helical shape of the BMA_H gel. The sample was in air for 1 h. Silicone oil was smeared on the gel surface to prevent water evaporation.

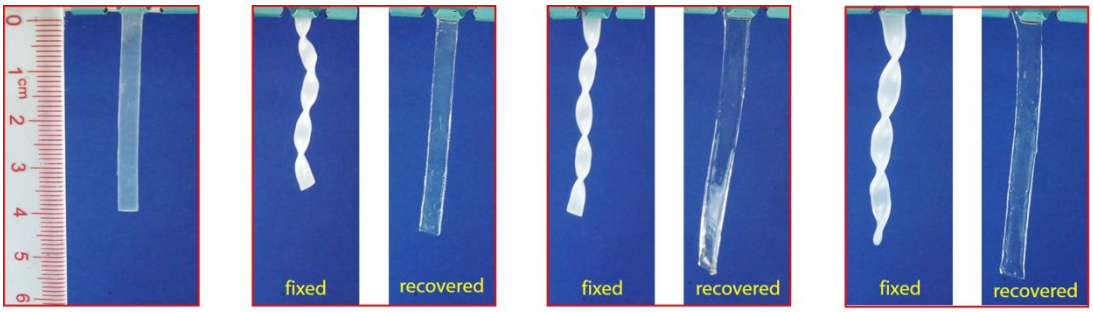

Figure S7. Successive ten times of the shape memory for the BMA_H gel by solvent exchange. The gel swells in DMSO during the repeat immersion.

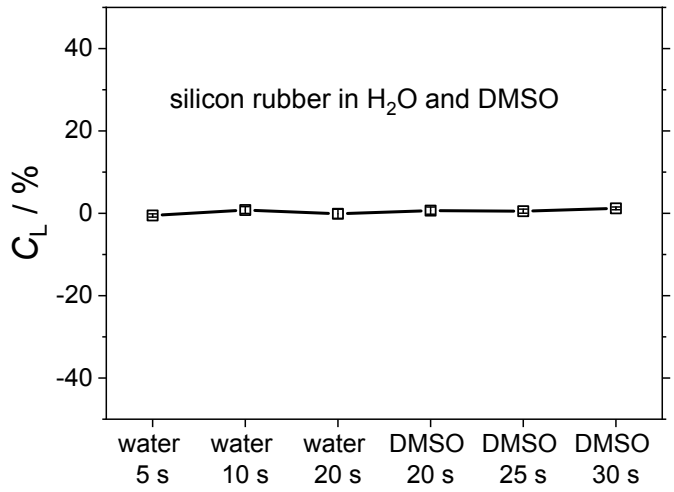

Figure S8. The percentage of length change of the silicon rubber in H_2O and DMSO at indicated time. $C_L = (C_t - C_0) / C_0 \times 100\%$, where C_t and C_0 were the length of immersed sample and original sample, respectively, and the error bars are also plotted (covered by the symbols). This result shows that the silicon rubber is inert without volume change in either H_2O or DMSO.

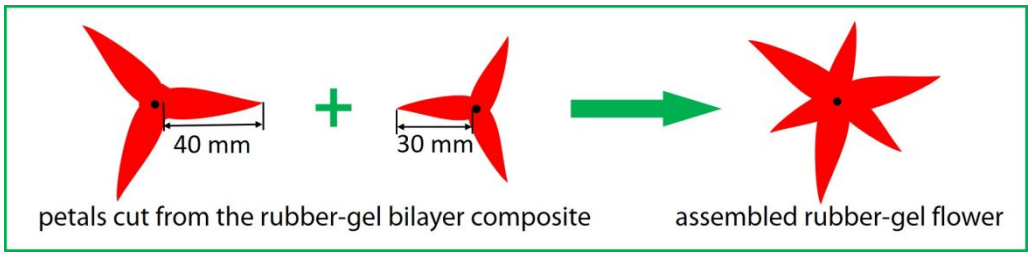

Figure S9. Schematic illustration of the assembling "Victoria Amazonica" flower from the rubber-gel bilayer.

Supporting Movie M1

The shape fixing of the BMA_H gel in H_2O and shape recovery in DMSO.

Supporting Movie M2

DMSO leakage warning device based on the shape memory BMA_H gel and its working process.

Supporting Movie M3

Repeat closure-blooming of the bioinspired rubber-gel bilayer “Victoria Amazonica” flower.