Supplementary Information

Rapid Charging of Thermal Energy Storage Materials through Plasmonic Heating

Zhongyong Wang,[a, ‡] Peng Tao, [a, ‡] Yang Liu,[a] Hao Xu,[a] Qinxian Ye,[a] Hang Hu,[a] Chengyi Song,[a] Zhaoping Chen,[b] Wen Shang[a,*], Tao Deng [a,*]

a. State Key Laboratory of Metal Matrix Composites, School of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai, 200240, P. R. China.

b. Research Institute, Baoshan Iron & Steel Co. Ltd, Shanghai, 201900, P. R. China.

*Correspondence and requests for materials should be addressed to W. S. (shangwen@sjtu.edu.cn) or T. D. (dengtao@sjtu.edu.cn).

[‡]Zhongyong Wang and Peng Tao equally contributed to this work.

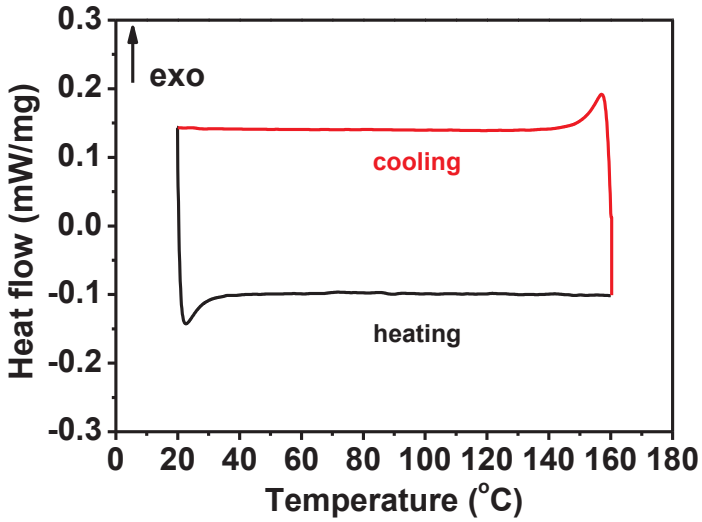

Figure S1. DSC curve of neat gel wax.

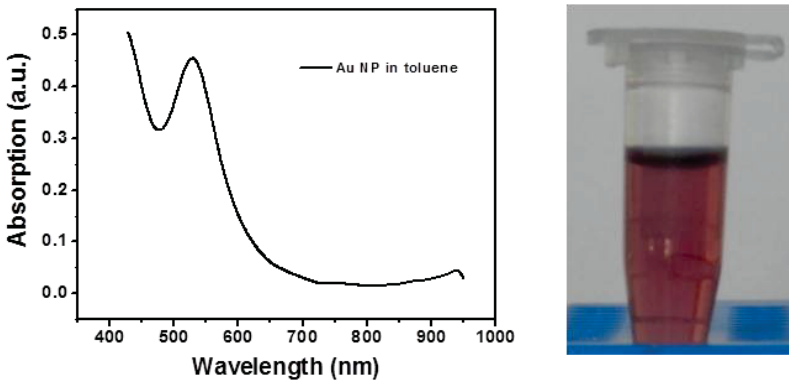

Figure S2. Absorption spectrum of Au NPs in toluene (left) and an photograph of transparent red dispersion (right).

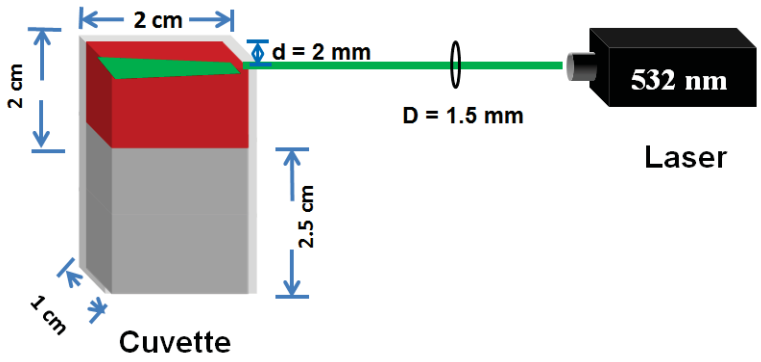

Figure S3. Specific dimensions of laser illumination experimental setup.

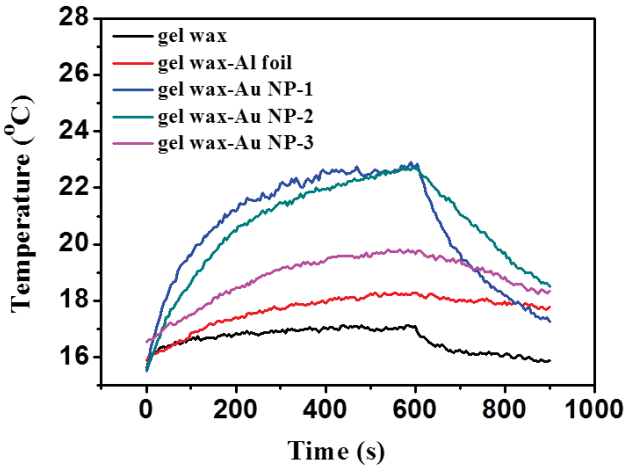

Figure S4. Temperature profile of thermal storage materials at the exit side of cuvette under laser illumination.

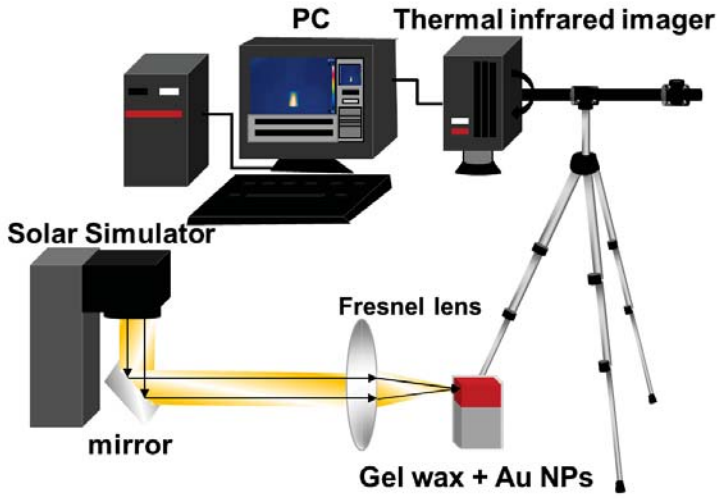

Figure S5. Schematic illustration of solar illumination experimental set up. The simulated sunlight was focused to a spot with a diameter of 1 cm by a PMMA Fresnel lens onto the thermal storage material sample.

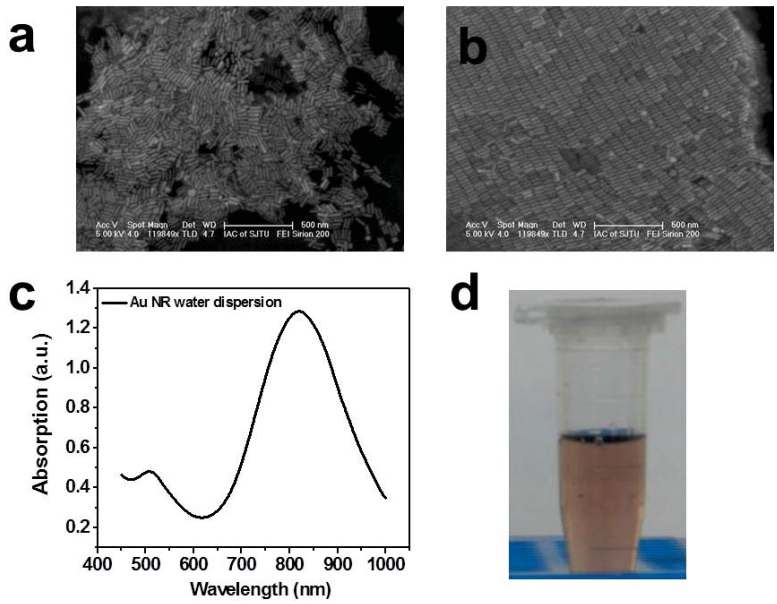

Figure S6. (a, b) SEM image of the as-synthesized Au NRs deposited on a Si wafer; (c) Absorption spectrum of Au NRs dispersion in water; (d) A photograph of Au NRs dispersion in water.

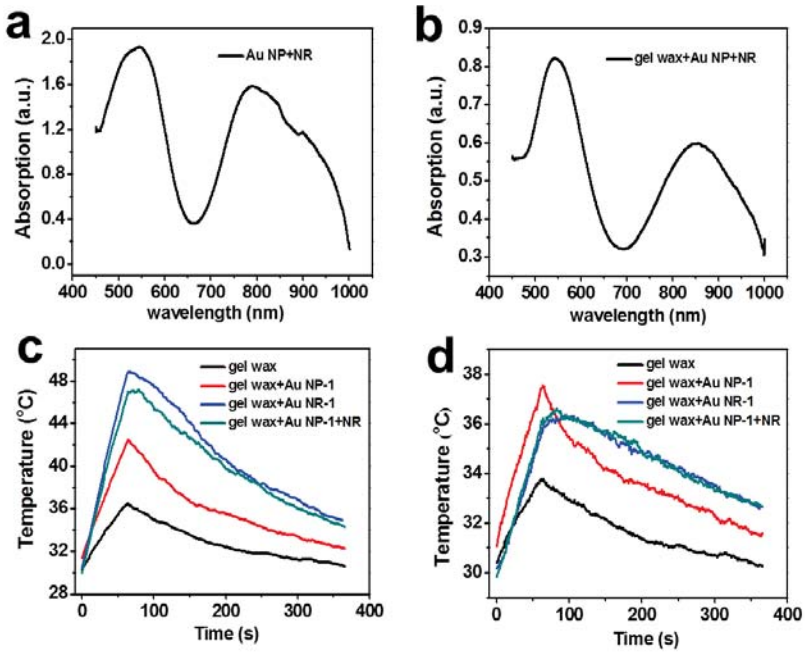

Figure S7. (a)Absorption spectrum of mixed Au NPs and NRs (at a weight ratio of 1:0.37) within chloroform; (b) Absorption spectrum of mixed Au NPs and NRs dispersed within gel wax; (c) Average temperature profile of neat gel wax, gel wax-Au NP-1, gel wax-Au NR-1 and gel wax filled with mixed Au NPs and NRs under 2.9 W/cm^2 solar illumination; (d) Temperature profile at the exit side of the cuvette.

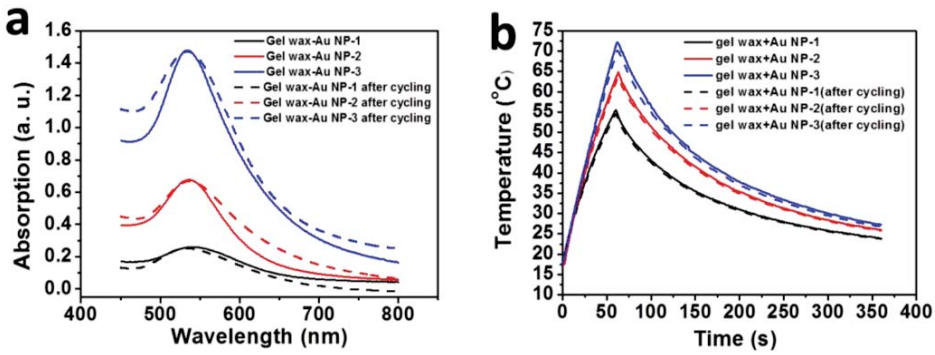

Figure S8. Stability test of the prepared plasmonic nanocomposites with repeated heating/cooling for 10 cycles. (a) UV-Vis absorption spectra; (b) Average temperature profile under 7.2 W/cm^2 sunlight illumination.