

Supporting Information

Photothermally Induced Shape Memory Effect in Thermoplastic Polyurethanes with Gold Nanoparticles

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Table S1. The content of AuNPs in the TPU-AuNP films

Sample	AuNP content in films, mass %	AuNP content in films, ppm
TPU-0%AuNP	0	0
TPU-0.25%AuNP	0.25	2500
TPU-0.47%AuNP	0.47	4700
TPU-1.3%AuNP	1.3	13000

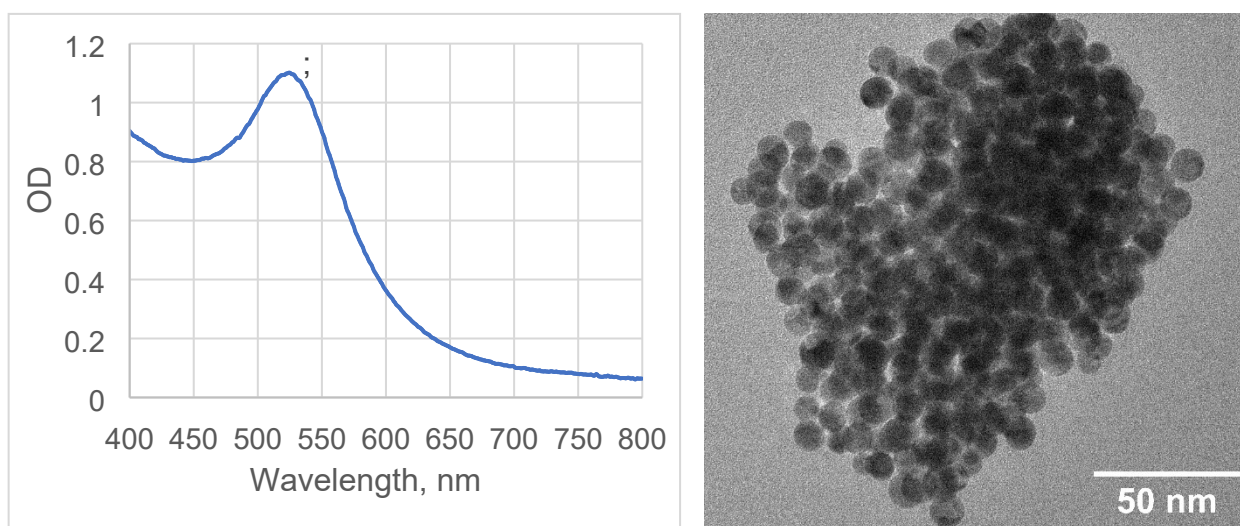


Fig. S1. UV-Vis absorption spectra (left) and TEM image (right) of the synthesized gold nanoparticles.

Table S2. Thermal properties of the synthesized nanocomposites.

Sample	T_{m1} , °	ΔH_1 , J/g*	T_{m2} , °	ΔH_2 , J/g	$t_{1/2}$, min	t_0 , min
TPU-0%AuNP	36.7	50.9	32.7	36.9	10.7	1.4
TPU-0.25%AuNP	35.4	50.2	32.7	31.9	5.6	1.5
TPU-0.47%AuNP	35.3	50.5	32.8	35.7	9	2.7
TPU-1.3%AuNP	35.6	46.6	32.8	35.0	11	2.8

* ΔH_1 and ΔH_2 represent melting enthalpy obtained from the first and second heating cycles, respectively; T_{m1} and T_{m2} , are corresponding melting points; $t_{1/2}$ denotes the crystallization half-time; t_0 represents the induction period.

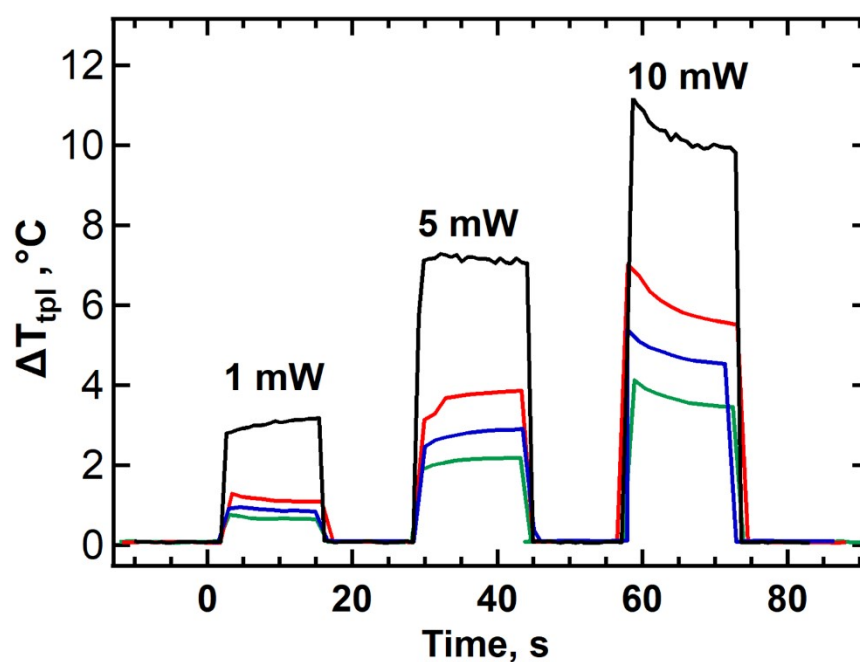


Figure S2. Temperature increase on the nanocalorimeter chip T_{tpi} as a function of laser power for TPU-0%AuNP (green), TPU-0.25%AuNP (blue), TPU-0.47%AuNP (red), and TPU-1.3%AuNP (black).

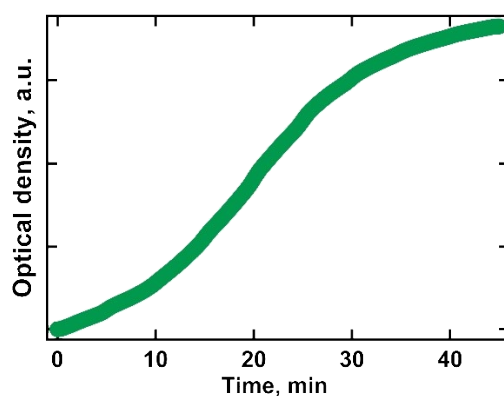


Figure S3. Crystallization kinetics of TPU-1.3%AuNP in region 2 extracted from a sequence of polarized optical microscopy images.

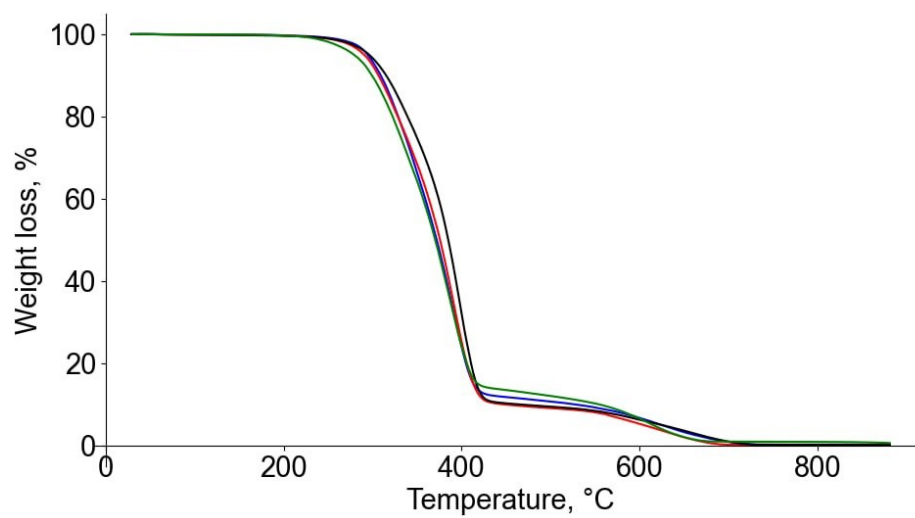


Figure S4. TGA curves (weight loss) of TPU-0%AuNP (green), TPU-0.25%AuNP (blue), TPU-0.47%AuNP (red), and TPU-1.3%AuNP (black).