Supporting Information

Thermoresponsive poly(vinyl alcohol) derivatives: preparation, characterization and their capability of dispersing gold nanoparticles

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Fig. S1 Typical XRD spectra of PVA, (A) PVA-GI, (B) PVA-AI and (C) PVA-VI
**Fig. S2** Typical influence of temperature on the light transmittance of PVA in deionized water

(concentration of PVA is 5 mg/mL)

**Fig. S3** (A) DLS diagram and (B) TEM image of citrate-stabilized AuNPs
**Fig. S4** Typical UV-vis spectra of the redispersed AuNPs stabilized by different concentration of (A) PVA-AI\textsubscript{14,1}, (B) PVA-AI\textsubscript{11,2} and (C) PVA in deionized water (original concentration of Au atom is $3 \times 10^{-4}$ mM).
**Fig. S5** Typical temperature dependent DLS of composites of AuNPs with PVA-AI$_{15.9}$ and PVA-VI$_{11.2}$ in deionized water (0.1 mg/mL)

**Fig. S6** TEM images of AuNPs stabilized by (A) PVA-AI$_{14.1}$ and (B) PVA-AI$_{11.2}$