Bi-functional fluorescent polymer dots: one-step synthesis via controlled hydrothermal treatment and application as probes for detection of temperature and Fe$^{3+}$ ions

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Figure S1. The DLS measurement of PDs

Figure S2. Characterization of PDs prepared at 180 °C for 5 days. (a) XPS survey and (b) XPS C1s spectra.
Figure S3. FT-IR spectra of the GSH, PDs and GSH–PDs.

Figure S4. (a) PL spectra of the PDs in the absence and present of surface modification with GSH. (b) Transmission electron microscopy (TEM) micrograph of the synthesized fluorescent GSH–PDs. (Inset: size distribution).
Figure S5. Thermoresponsive of the emission intensity of pure PDs in aqueous solution. (a) Fluorescence emission spectra measures under the excitation of 330 nm with the increase of temperature from 20 to 75 °C at a step of 5 °C (from top to bottom); (b) change of PL intensity with five cycles when temperature directly increases from 20 to 60 °C and deceases back to 20 °C.

Figure S6. (a) UV–vis spectra of GSH–PDs with temperature at 20 and 75 °C. (Inset: photographs of the GSH–PDs under the irradiation visible at 20 °C (left) and 75 °C (right). (b) Transmission electron microscopy (TEM) micrograph of the fluorescent GSH–PDs after thermal treatment at 75 °C.
Figure S7. Photographs of the GSH–PDs with different concentration of Fe$^{3+}$ (0, 0.1, 1.0, 10, 100 and 500 µM) under the irradiation visible (up) and UV (down) light.