Supporting Information

Herein we will present the experimental procedures and the results for thermal analysis FT-IR spectra of block copolymers. In addition, some preliminary results for synthesis of cisplatin-encapsulated PEO using PEO-\(\text{b-PMAc}\) and TiO\(_2\) nanoparticles stabilized by PEO-\(\text{b-PMAHZ}\).

Experimental section

Synthesis of cisplatin and TiO\(_2\) nanoparticles. A 1.0 g (2.06 × 10\(^{-4}\) mol) of PEO-\(\text{b-PMAHZ}\) was dissolved in distilled water (20 mL) under N\(_2\) gas flow, followed by delivering TiCl\(_4\) (0.22 mL) with drop by drop using a syringe and stirring at 30 °C for 12 h. After 12 h later, the solution was centrifugated at 10,000 rpm for 10 minutes and decanted. The final product was dried in vacuum oven at room temperature for 48 h. A 1.0 g (1 mole) of PEO-\(\text{b-PMAc}\) was dissolved in distilled water (15 mL) under inert gas flow, followed by delivering a 0.09 gram of cisplatin (dichlorodiamine platinum, 99.99%; Acros) and stirring for 24 h.

Characterization. The differential scanning calorimetric (DSC) thermal analysis of all the products for observation of melting temperature, glass transition temperature, and crystallization temperature was performed at a heating rate of 20 °C/min by heating up to 350 °C using the TA Instrument DSC model Q20. FT-IR spectra were obtained by using a NICOLET 380 equipped with a ZnSe window.

Results and Discussion

Figure S1 shows FT-IR spectra of PEO and the corresponding block copolymers (Block 1 in Table 1). The exhibition of relatively strong stretching bands near the wavelength 1650 cm\(^{-1}\) of block copolymers inform the existence of the carbonyl groups on the polymer chains compared with that of pure PEO.

Figure S2 shows DSC thermograms of PEO and all the corresponding block copolymers (Block 4 in Table 1 in the main text). Practically, no difference of some analytical results such as \(^{13}\)C-NMR and FT-IR spectra between PEO-\(\text{b-PMAc}\) and PEO-\(\text{b-PMAHZ}\) could be observed. However, the DSC analysis informed a great difference in thermal behaviors of two block copolymers.

Figure S3 is a typical TEM image of PEO-\(\text{b-PMAc}\)-conjugated cisplatin which does not retain any crystallinity resulting in no exhibition of electron diffraction pattern.

Figure S4 shows the color change with the reaction time; the left side photos are the phases with cisplatin in aqueous block copolymer solution and the block copolymer solution itself. The right hand-side photos indicate their colors after 24 h.

Figure S1. FT-IR spectra of PEO and the corresponding block copolymers (Block 1 in Table 1).

Figure S2. DSC thermograms of PEO and the corresponding block copolymers.

Figure S3. TEM image of PEO-\(\text{b-PMAc}\)-conjugated cisplatin.
On the basis of the XRD pattern, the produced TiO₂ nanoparticles should be anatase.

Figure S4. Photo images of PEO-based block copolymer-cisplatin conjugates in water; at the beginning and at the end (24 h).

Figure S5. TEM image (a) and ED pattern (b) of TiO₂ nanoparticles stabilized by PEO-ₐ-PMAHZ from Block 1 in Table 1.

Figure S6. XRD pattern of TiO₂ nanoparticles stabilized by PEO-ₐ-PMAHZ from Block 1 in Table 1.

On the basis of the XRD pattern, the produced TiO₂ nanoparticles should be anatase.

Figure S7. Photo images of water-dispersible iron oxide nanoparticles stabilized by PEO-ₐ-PMAc (a) and by PEO-ₐ-PMAHZ (b) deimidated from Block 4 in the basic condition for the phase behavior observed by externally applying magnet.

Figure S7 shows the photo images of iron oxide nanoparticles stabilized by block copolymers in the basic condition.