

Supporting information

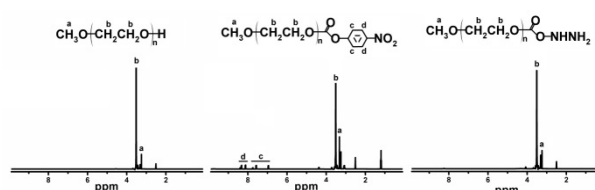
1. The synthesis and characterization of PEG-NHNH₂

a. synthesis

Mono-methoxy polyethylene glycol (5g) was dissolved in 10mL of DCM and triethylamine(0.4mL) was added in the solution. The PEG solution was dropped into p-NPC (1g, 2 equiv) solution in 5mL DCM for 0.5h, and reacted for additional 24h with stirring. The p-NPC conjugated Mono-methoxy polyethylene glycol (PEG-NPC) was precipitated in the n-hexane solution and dried. The PEG-NPC (3g) dissolved in 10mL of DCM was added slowly into hydrazine monohydrate solution (1mL) in 5mL DCM and stirred overnight. After DCM was removed in vacuo, the product was dissolved in deionized water, followed by dialyzing against water. Finally, the Mono-methoxy PEG-NHNH₂ was obtained by the freeze-drying.

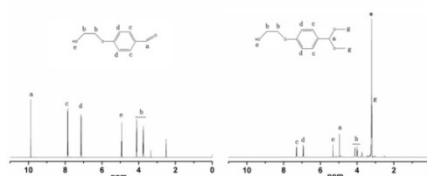
b. Characterization

The H¹-NMR spectrum, supporting information Fig 1



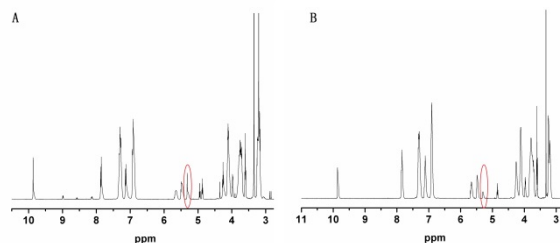
Supporting information Fig 1

2. The H¹-NMR of material and monomer



Supporting information Fig 2

3. The H¹-NMR of HBPA at different period

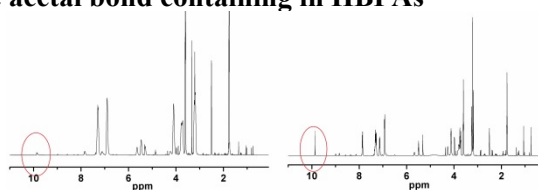


Supporting information Fig 3 (A: H¹-NMR of HBPA at the time when HBPA was synthesized;

B: H¹-NMR of HBPA 3 months after HBPA was synthesized)

Three months later, the intensity of the terminal units decreased, but the intensity of the aldehyde increased.

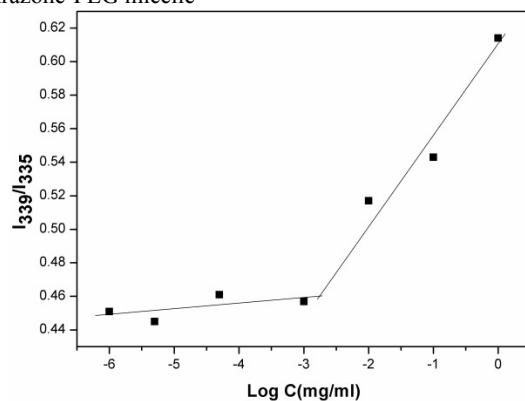
4. The adjustment of the acetal bond containing in HBPA



Supporting information Fig 4

When 1% of 4-(2-Hydroxyethoxy)-benzaldehyde was added into the monomer in the synthesis procedure of HBPA, the proton intensity of acetal bond increased obviously

5. The CMC of the HBPA-hydrazone-PEG micelle



Supporting information Fig 5