

Supporting Information

Facile Preparation of Water Soluble CuPt Nanorods with Controlled Aspect Ratio and Study on Their Catalytic Properties in Water

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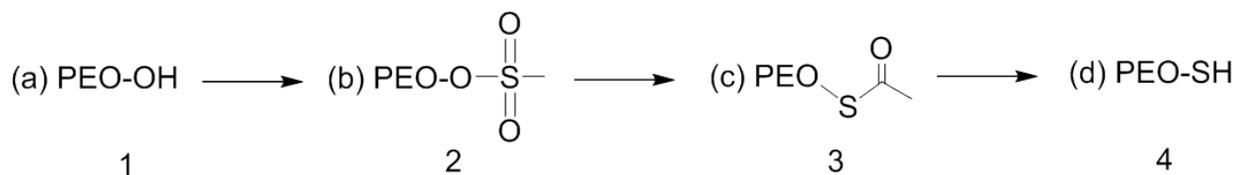
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◆ Materials

Copper acetylacetonate (Cu(acac)₂, Sigma-Aldrich), platinum acetylacetonate (Pt(acac)₂, Sigma-Aldrich), 1,2-hexadecanediol (Sigma-Aldrich), oleic acid (OA, Sigma-Aldrich), oleylamine (OLA, Sigma-Aldrich), 1-octadecene (Sigma-Aldrich), poly(ethylene-oxide) (PEO-OH) (M_n = 2.4 kg/mol, polydispersity index (PDI) = 1.05, Polymer Source), triethylamine (Sigma-Aldrich), dichloromethane (DCM, anhydrous, Sigma-Aldrich), methanesulfonyl chloride (Sigma-Aldrich), MgSO₄ (Sigma-Aldrich), tetrahydrofuran (THF, anhydrous, Junsei), potassium thioacetate (Sigma-Aldrich), concentrated HCl, chloroform, hydrogen peroxide (H₂O₂) and o-phenylenediamine (OPD, Sigma-Aldrich) were used as received.

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Scheme S1. Synthesis of thiol end-functionalized PEO



Thiol-terminated PEO (PEO-SH) was prepared via a three-step reaction by following a modified procedure from the literature.¹

1. Synthesis of PEO-SO₃CH₃ (2). PEO-OH (2 g, 0.84 mmol) and triethylamine (0.64 ml, 4.64 mmol) were dissolved in anhydrous DCM (20 ml) and cooled down to 0 °C for 15 min. Methanesulfonyl chloride (0.36 ml, 4.64 mmol, Aldrich) was then added to the mixture. After stirring for 6 hrs at room temperature, the mixture was quenched with DI water, and extracted with diethyl ether. The layer of diethyl ether was collected, and residual water was removed with MgSO₄. The final product (1.97 g, 95%) was obtained *in vacuo*. δ_{H} (500 MHz; CDCl₃; Me₄Si) 3.08 (s, SO₃Me) and 3.49-3.77 (m, CH₂ of PEO chain).

2. Synthesis of PEO-SCOCH₃ (3). As-synthesized PEO-SO₃CH₃ (1.97 g, 0.79 mmol) and potassium thioacetate (0.28 g, 1.98 mmol, Aldrich) were dissolved in anhydrous THF (50 ml) under a nitrogen atmosphere. The reaction mixture was degassed three times with nitrogen and then heated to 60 °C. After stirring for 3 hr, the mixture was quenched by DI water and extracted with chloroform. The chloroform layer was collected, and residual water was removed with MgSO₄. The final product (1.65 g, 85%) was obtained *in vacuo*. δ_{H} (500 MHz; CDCl₃; Me₄Si) 2.33 (s, SCOME) and 3.49-3.79 (m, CH₂ of PEO chain).

3. Synthesis of PEO-SH (4). As-synthesized PEO-SCOCH₃ (1.65 g, 0.67 mmol) was dissolved in methanol under a nitrogen atmosphere and degassed three times. Concentrated HCl (0.8 ml) was added to the solution. The mixture was refluxed at 80 °C for 1 day, quenched with DI water, and then extracted

with chloroform. The chloroform layer was collected, and residual water was removed by MgSO₄. The final product (1.47 g, 91%) was obtained *in vacuo*. δ_{H} (500 MHz; CDCl₃; Me₄Si) 2.70 (m, SH) and 3.49-3.79 (m, CH₂ of PEO chain).

◆ **References**

1. A. K. Oyelere, P. C. Chen, X. H. Huang, I. H. El-Sayed and M. A. El-Sayed, *Bioconjugate Chem*, 2007, 18, 1490-1497