

Supporting Information

Large-Scale Synthesis of Water-Soluble Nanowires as Versatile Templates for Nanotubes

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Experimental

Synthesis of Na₂SiF₆ nanowire

Na₂SiF₆ nanowires were prepared by mixing 2 mmol Na₂SiO₃, 15mmol NaF, and 0.5g PAA ((C₃H₄O₂)_n) in ethylene glycol and stirring for 1 h at 120 °C. The white precipitates were centrifugalized, washed with ethanol and finally dried at 80°C in air.

Synthesis of Pt, CdS and SnO₂ nanotubes

For synthesis of Pt nanotubes, 10 mg Na₂SiF₆ nanowires were dispersed in 20 ml ethanol solution of H₂PtCl₆ (4 mM). The solution was vigorously stirred and followed by dropwise adding NaBH₄ ethanol solution (30 mL, 10mM). The black precipitates were centrifugalized, washed with ethanol and finally rinsed with water to obtain pure Pt nanotubes.

For synthesis of CdS nanotubes, 10 mg Na₂SiF₆ nanowires were added into 30 ml tetrahydrofuran (THF) solution of sulphur powder and CdCl₂ (1 mmol), which were

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sonicated for 0.5 h. And then, 30 ml THF solution of NaBH_4 (20 mM) was dropwise added. The yellow precipitates were centrifugalized, washed with ethanol and finally rinsed with water to obtain pure CdS nanotubes.

For synthesis of SnO_2 nanotubes, 10 mg Na_2SiF_6 nanowires were dispersed in 20 ml ethanol solution of SnCl_4 (5 mM). The solution was vigorously stirred and followed by dropwise adding NaBH_4 ethanol solution (30 mL, 10 mM). The white precipitates were centrifugalized, washed with ethanol and finally rinsed with water to obtain pure SnO_2 nanotubes.

Characterization of products

The obtained products were characterized by field emission scanning electron microscopy (FESEM, Hitachi S-4800), and high-resolution transmission electron microscopy (HRTEM, JEOL JEM-2010F) with energy-dispersive X-ray spectrometer (EDX). The infrared (IR) spectra were measured with a Nicolet Nexus FTIR 670 spectrophotometer.

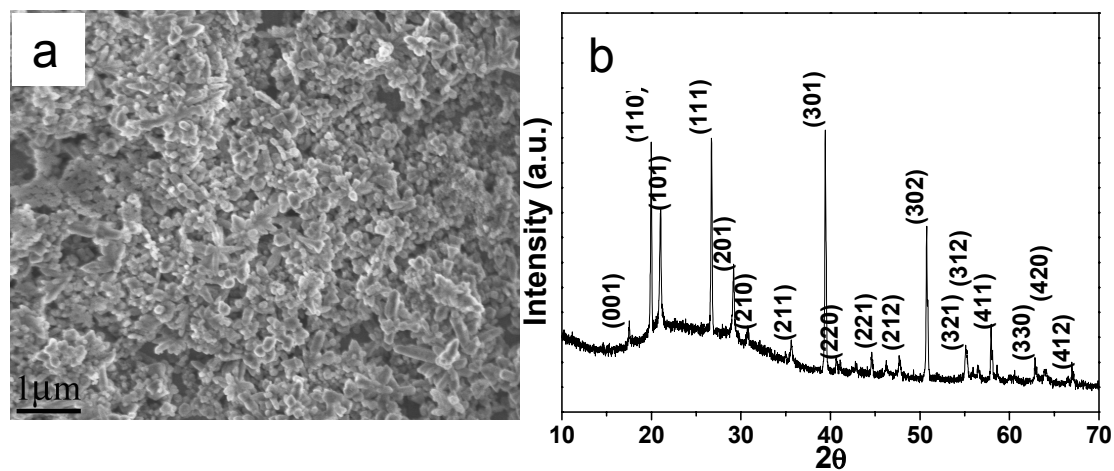


Figure S1 SEM (a) and XRD pattern (b) of Na_2SiF_6 particles synthesized by using acetic acid as a surfactant instead of PAA

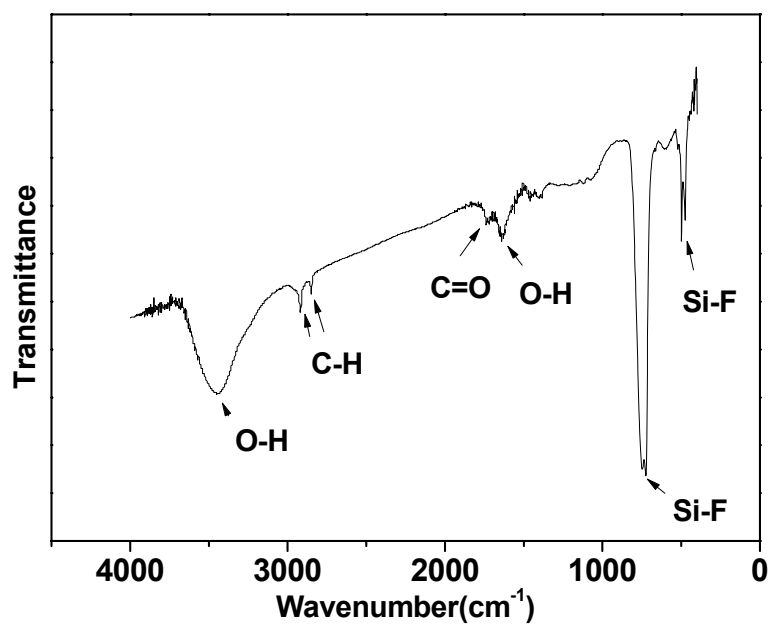


Figure S2 FTIR spectrum of as-synthesized Na₂SiF₆ nanowires

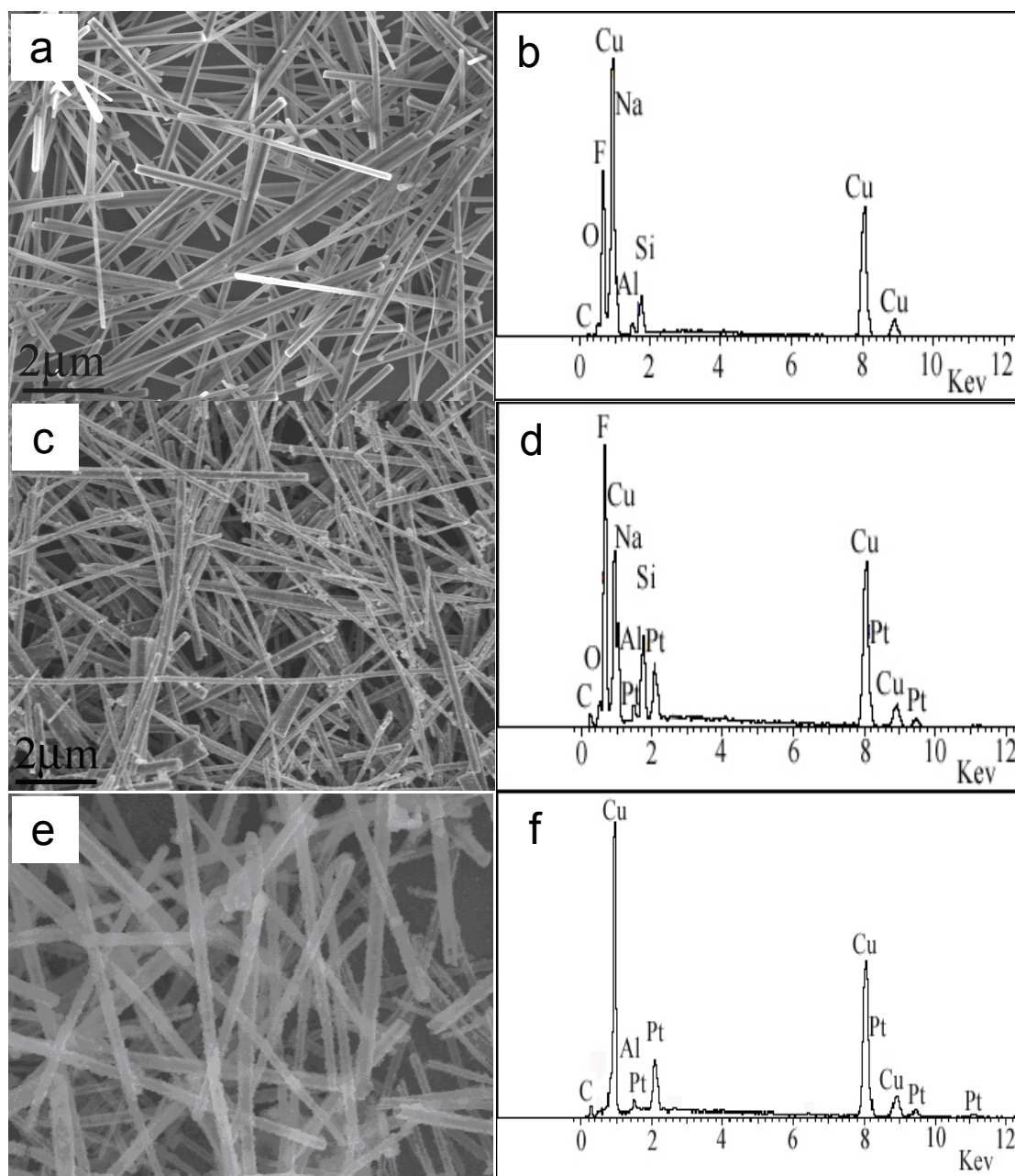


Figure S3 (a) SEM image and (b) corresponding EDX pattern of the Na_2SiF_6 nanowires, (c) SEM image and (d) corresponding EDX pattern of the Na_2SiF_6 -Pt core-shell nanowires, (e) SEM image and (f) corresponding EDX pattern of the Pt nanotubes.

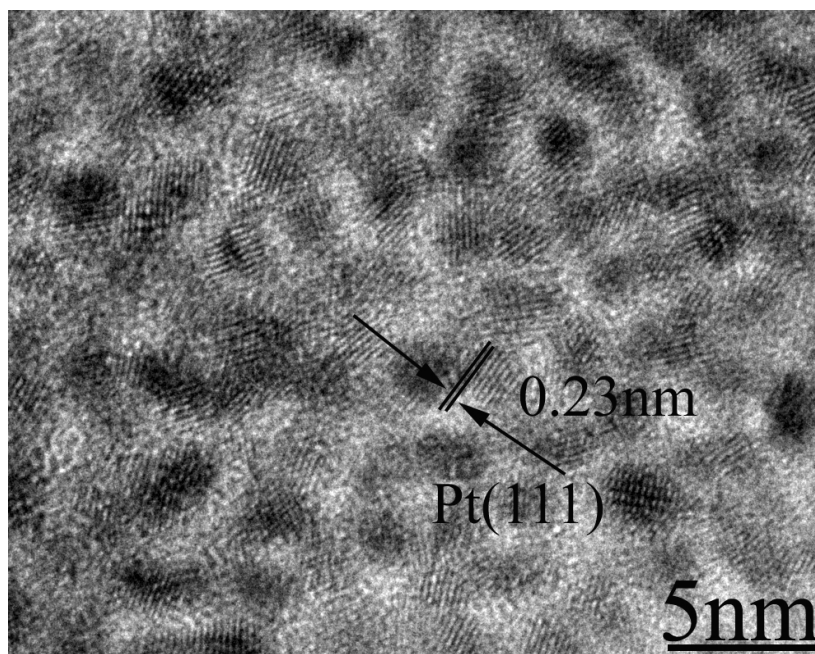


Figure S4 HRTEM image of Pt nanotube.

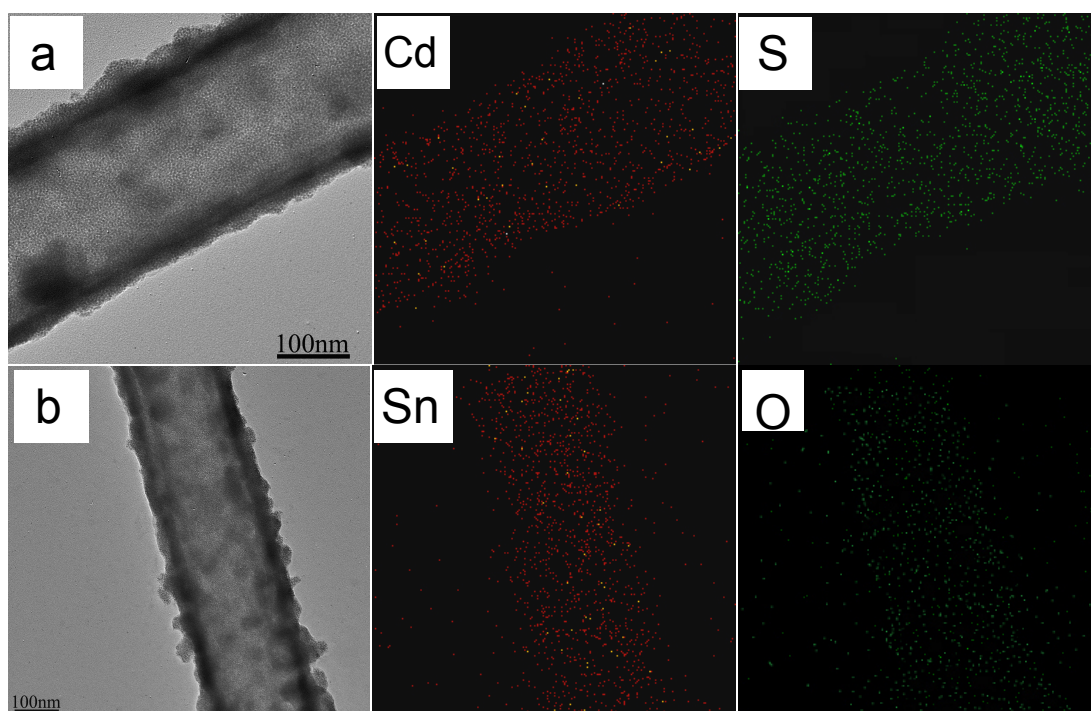


Figure S5 TEM image and corresponding EDX mapping of an individual CdS (a) and SnO₂ nanotube (b).