Electronic Supplementary Information (Experimental section, Figure S1~S8)

Experimental section

Mesoporous silica was synthesized using a precursor solution according to a previous report though $C_{16}EO_8$ was used instead of Brij 56.[20] TEOS (10.4 g, Kishida Chemical Co.), ethanol (12 g), and dil. HCl (pH 2, 4.5 g, Kanto Chemical Co.) were mixed. After the mixture was stirred for 20 min, $C_{16}EO_8$ (2.9 g) and ethanol (8.0 g) were added, and the mixture was stirred for 3 h. The total molar ratio was TEOS/$C_{16}EO_8$/HCl/ethanol/H_2O=16.6:0.14:0.015:145:83.3. The precursor solution was dropped onto a PAAM and introduced into channels. The PAAM was dried under a reduced pressure condition. As-prepared PAAM was calcined at 400 $^{\circ}$C for 15 h at a heating rate of 1 $^{\circ}C \cdot min^{-1}$. The calcined PAAM was dissolved with an aqueous solution of about 10 wt% phosphoric acid. Then, silica nanorods were washed with water to remove phosphoric acid. When this precursor solution dropped onto a flat glass substrate, a 2D-hexagonally arranged mesoporous silica thin film was obtained.

Figure S1

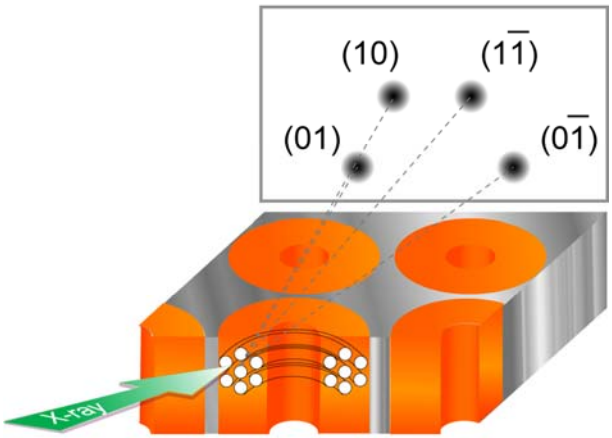

Figure S1 The 2D-XRD geometry and the proposed LLC mesophase structure within the PAAM after the reduced pressure process.

Figure S2

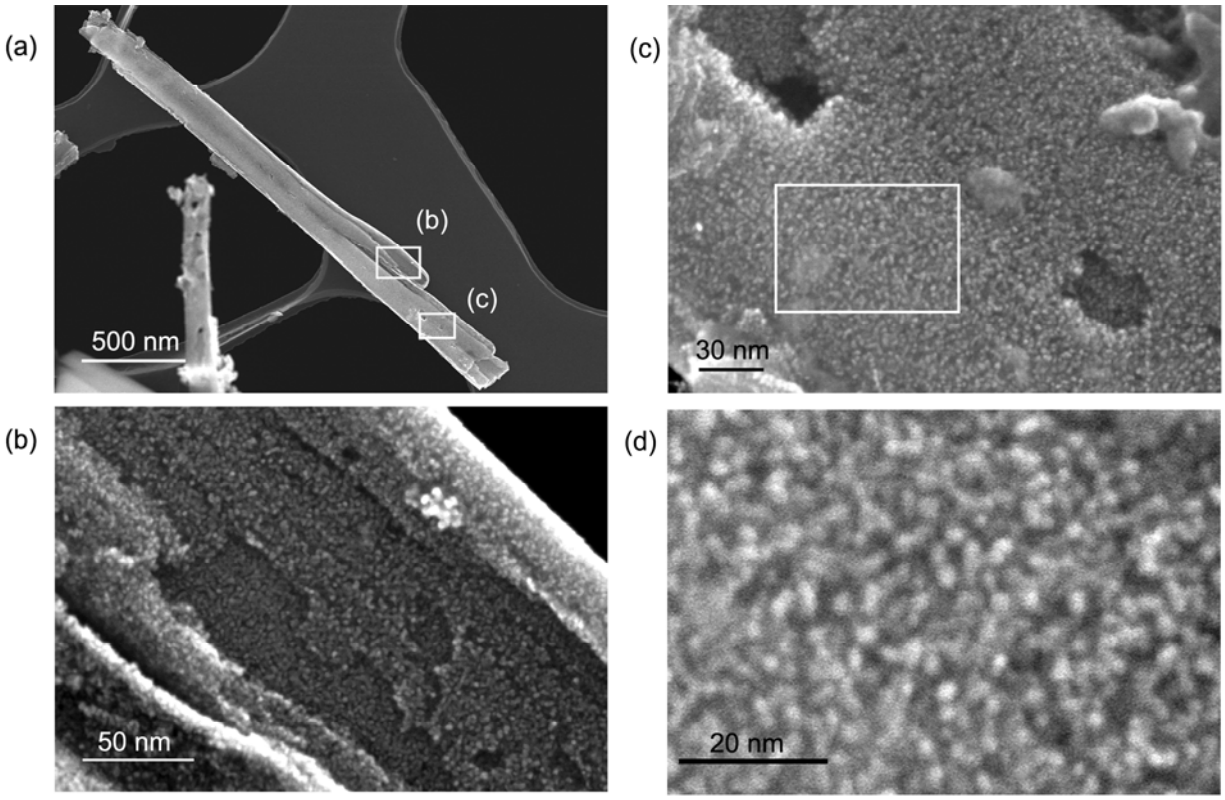

Figure S2 SEM images of mesoporous Pt nanotubes. Figures (b) and (c) are internal and outer surfaces of the nanotubes. Figure (d) is a highly magnified image of Figure (c). Figures (b) and (c) are highly magnified images of the square areas in the Figure (a), and Figure (d) is a highly magnified image of the square area in Figure (c).

Figure S3

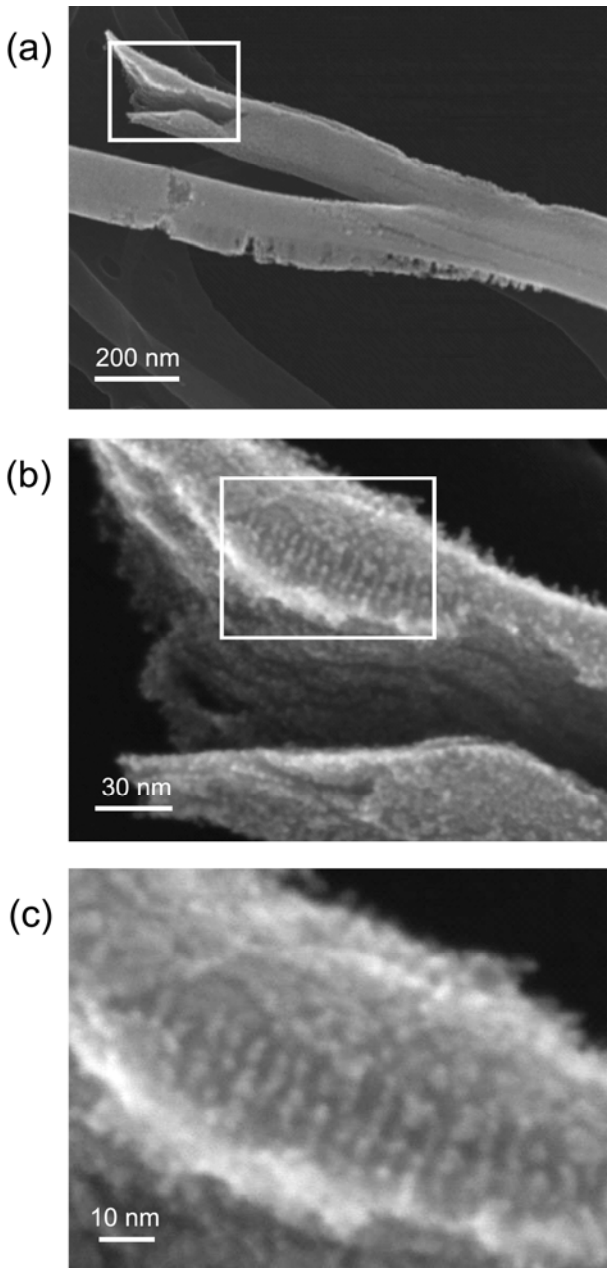

Figure S3 HR-SEM images of mesoporous Pt nanotubes. Figures (b) and (c) are highly magnified images of the square areas in the Figures (a) and (b), respectively.

Figure S4

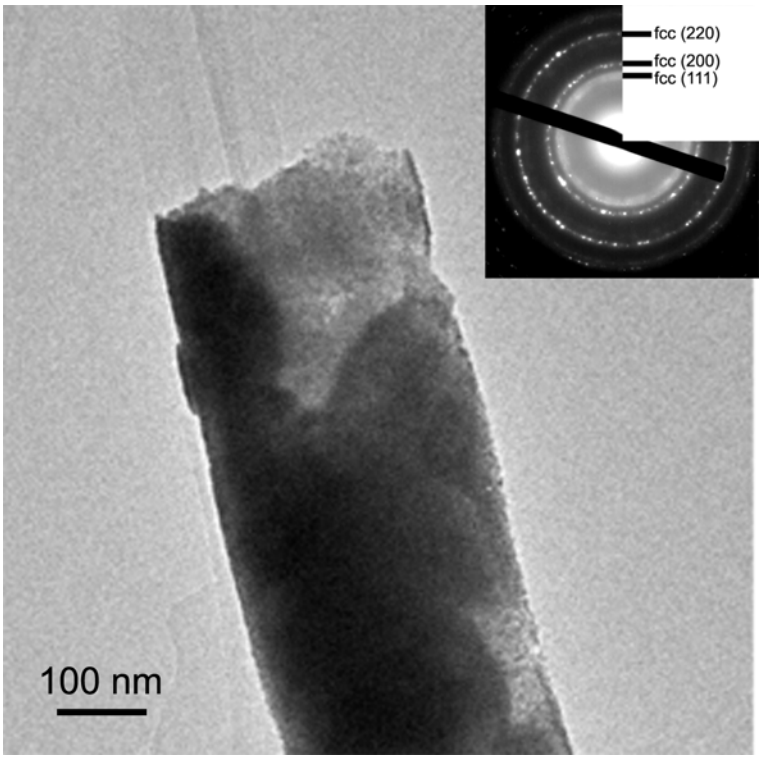

Figure S4 TEM image of the mesoporous Pt nanotubes. Inset image is the selected ED patterns of a 100 nm region.

Figure S5

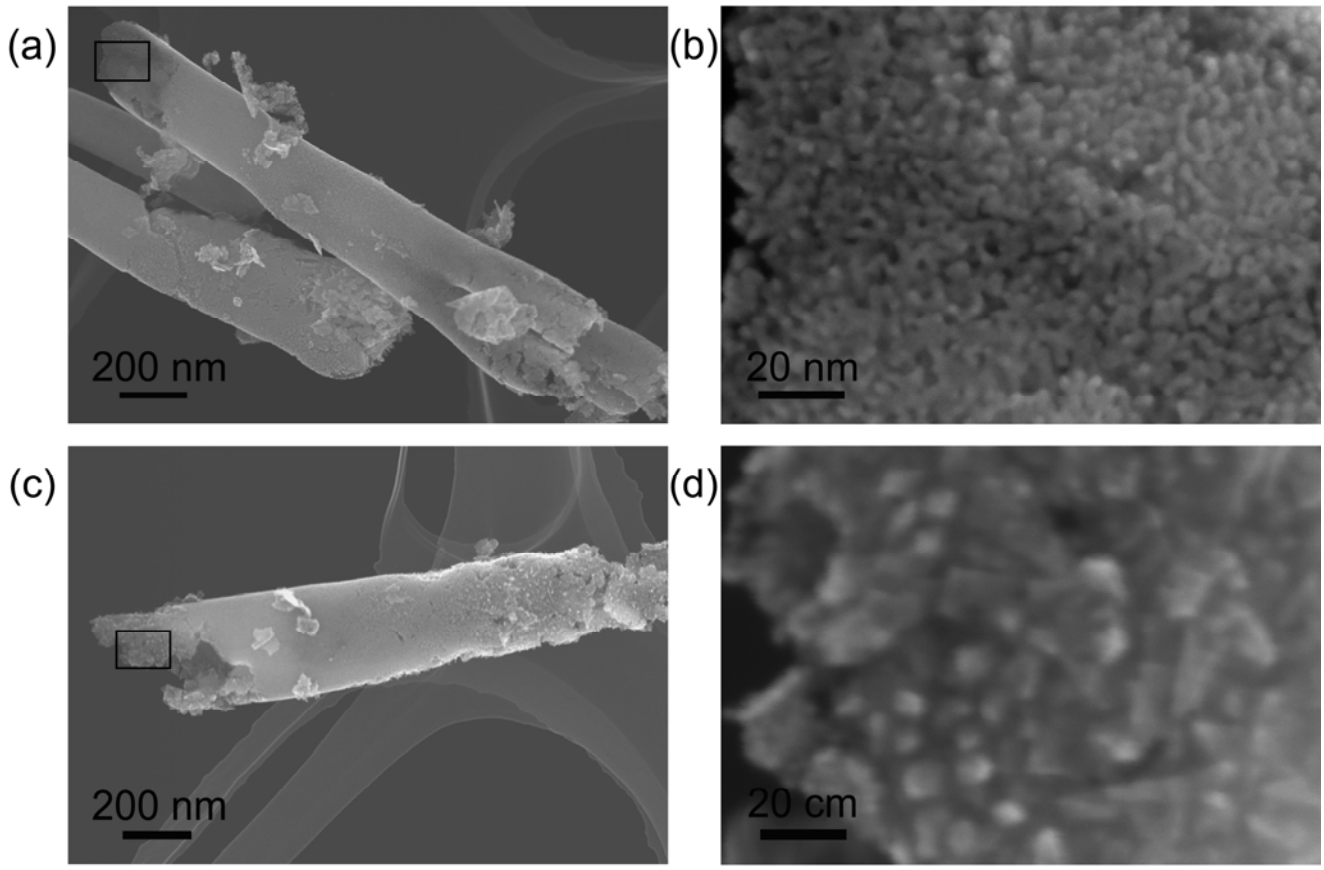

Figure S5 SEM images of the mesoporous Pt nanotubes treated at (a), (b) 100 ˚C and (c), (d) 150 ˚C, respectively. Figures (b) and (d) are highly magnified images of the square areas in the Figures (a) and (c), respectively.

Figure S6

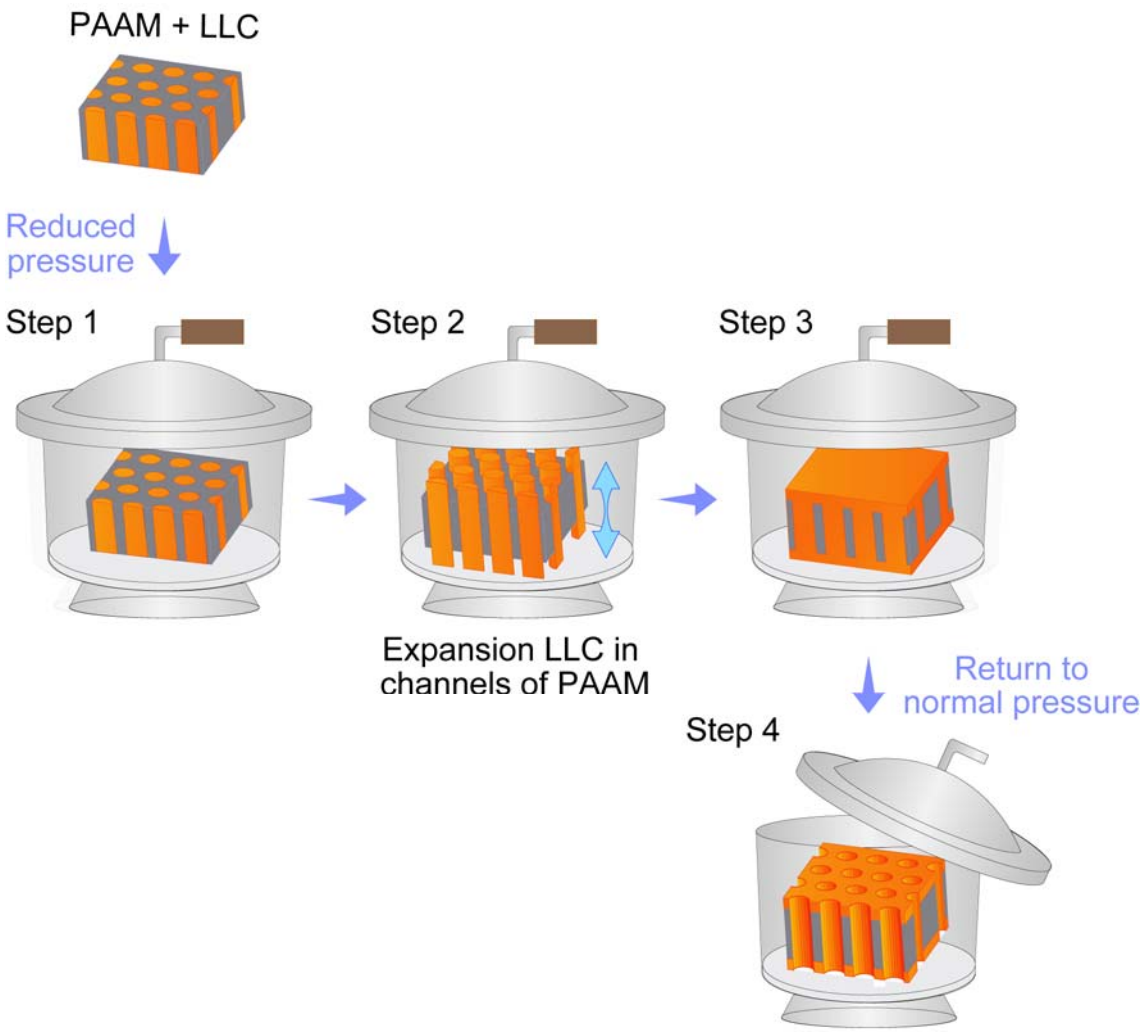

Figure S6 Suggested formation mechanism for the mesoporous Pt nanotubes.

Figure S7

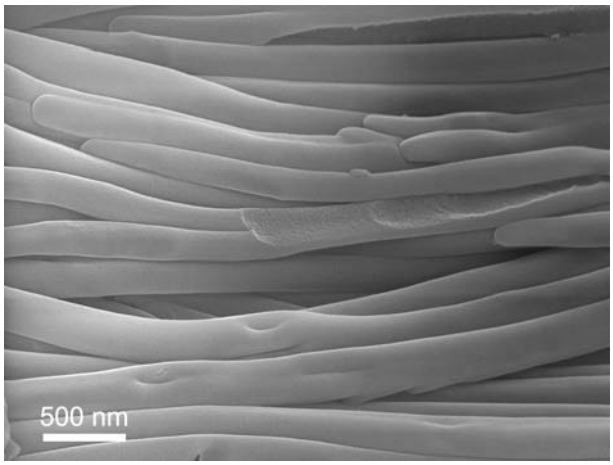

Figure S7 SEM image of the mesoporous silica nanorods using PAAM.

Figure S8

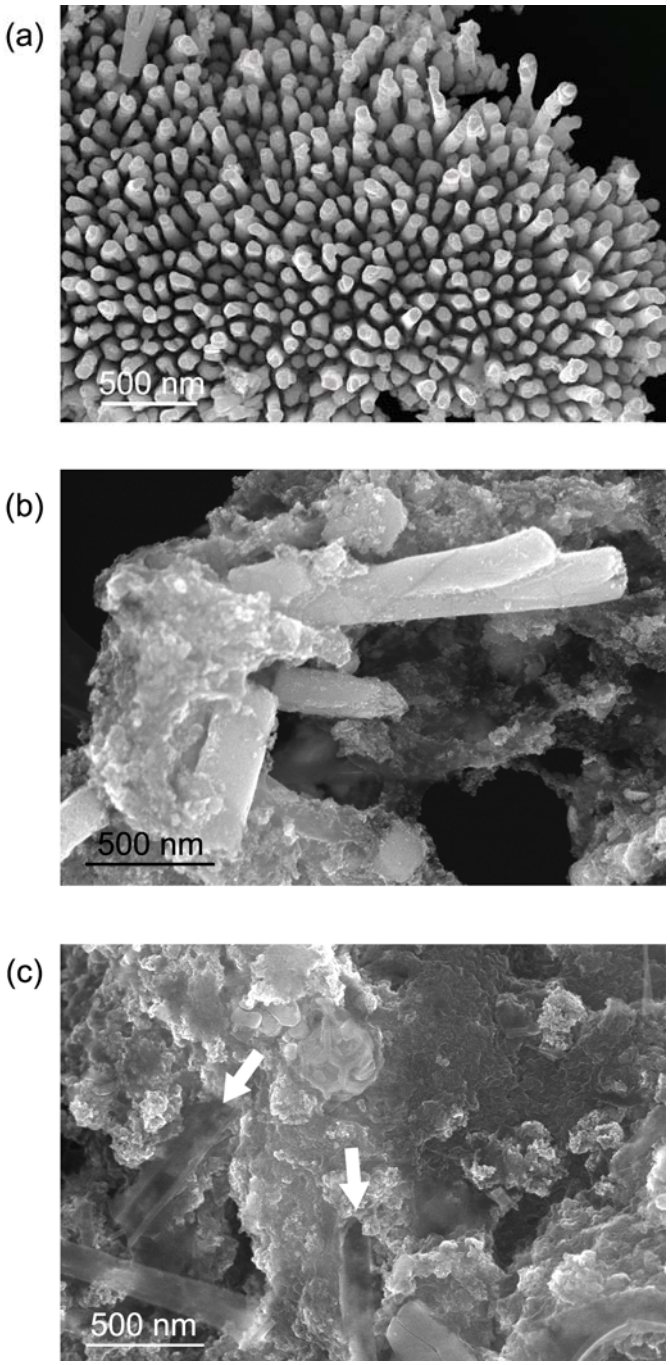

Figure S8 SEM images of the products prepared by changing the amount of ethanol/surfactant weight ratios: (a) 30, (b) 50, and (c) 100. In the Figure (c), mesoporous Pt nanotubes are indicated by arrows.