Electronic Supplementary Information (Figure S1 to S10)

Figure S1

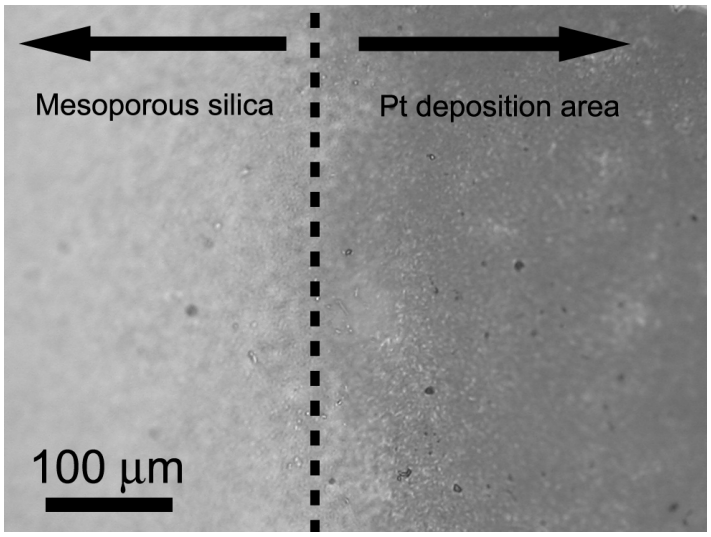

Figure S1 Optical microscopic image of the mesoporous silica/Pt composite film before silica removal. The Pt electrodeposited area shows black color (see the right side region).

Figure S2

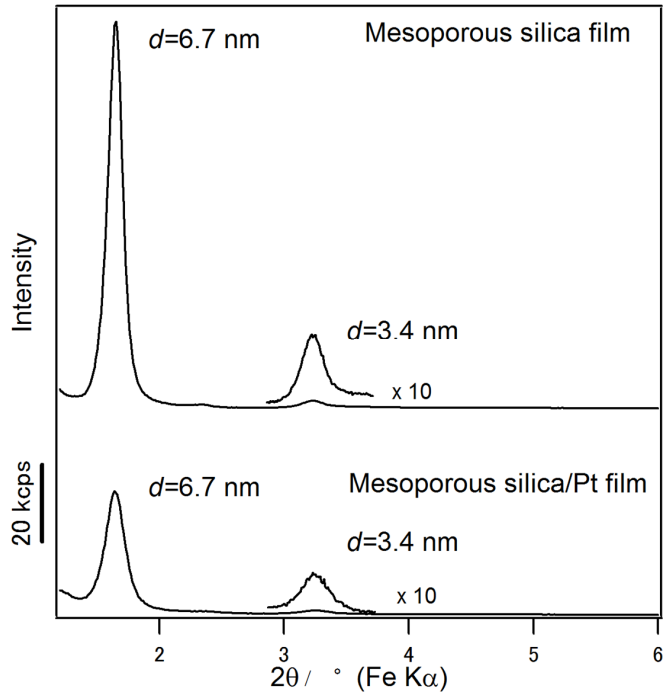

Figure S2 Low-angle XRD patterns of the mesoporous silica films before and after Pt electrodeposition.

Figure S3

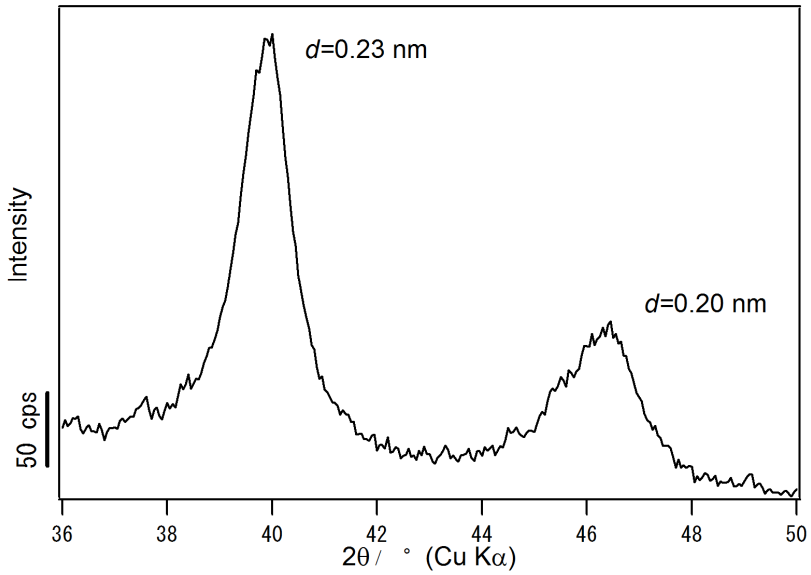

Figure S3 Wide angle XRD pattern for the mesoporous silica/Pt composite film before silica removal.

Figure S4

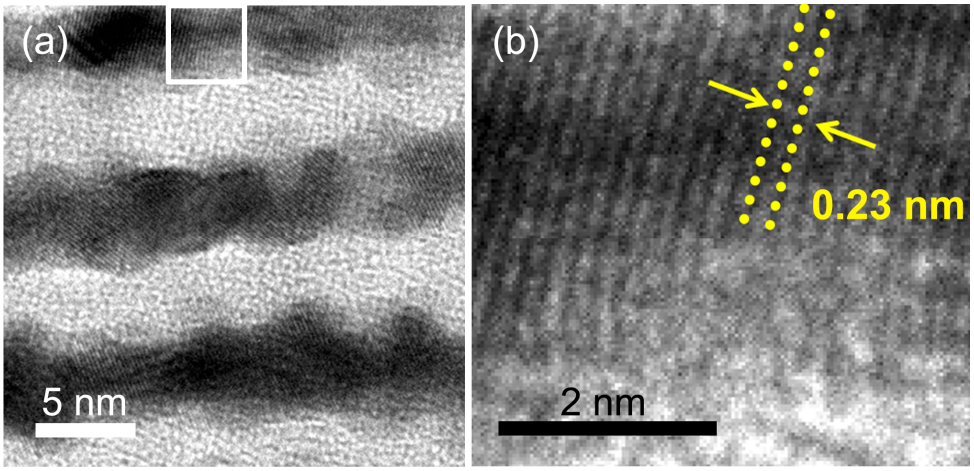

Figure S4 TEM images of the mesoporous silica/Pt film before silica removal. Figure (b) is the enlarged image of the square area in Figure (a). The lattice fringes with 0.23 nm in *d*-spacing are attributable to the (111) plane of the Pt *fcc* structure.

Figure S5

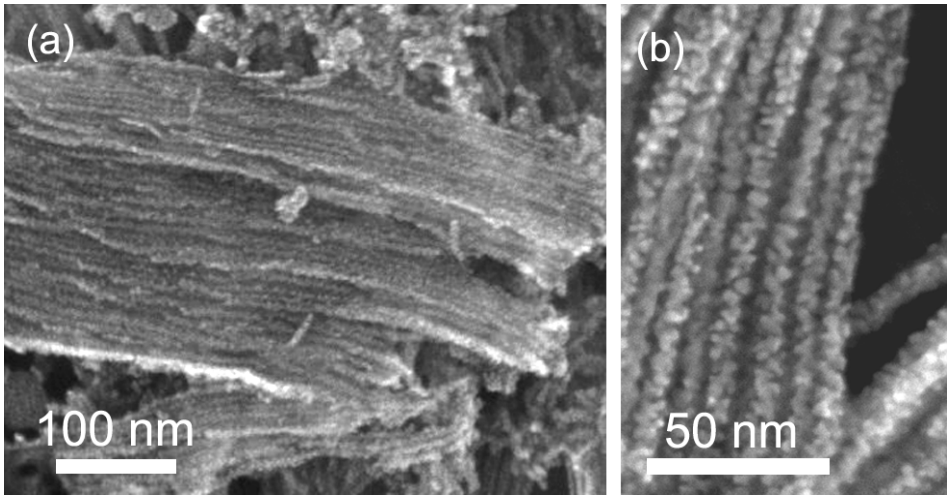

Figure S5 (a) Low and (b) high magnified SEM images of Pt nanoworms after silica removal.

Figure S6

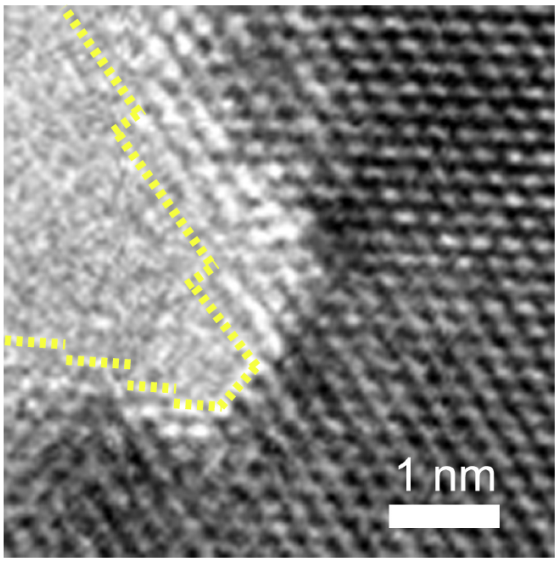

Figure S6 Enlarged TEM image of Pt nanoworm displayed in **Figure 2b**. Rich atomic steps with a concave surface topology are indicated by yellow dot-lines.

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Figure S7

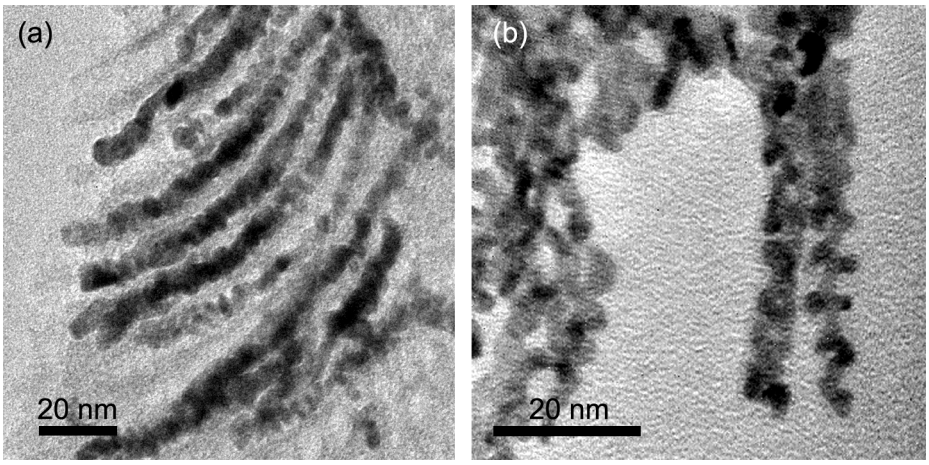

Figure S7 TEM images of Pt nanoworms after sonicated strongly and annealed at 150 °C for 24 h. ((a) Pt nanoworms encapsulated by rigid silica walls (before silica removal), (b) Pt nanoworms after silica removal.)

Figure S8

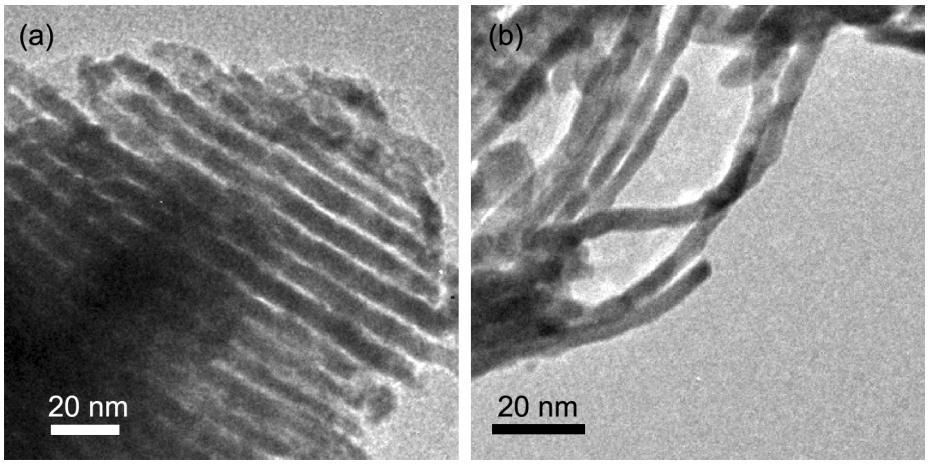

Figure S8 TEM image of (a) mesoporous silica/Pt composite and (b) Pt nanowires after removal of silica. The Pt nanowires are deposited from $H_2PtCl_6 \cdot 6H_2O$ (50 wt%) aqueous solution without surfactants at -0.042 V *vs*. Ag/AgCl.

Figure S9

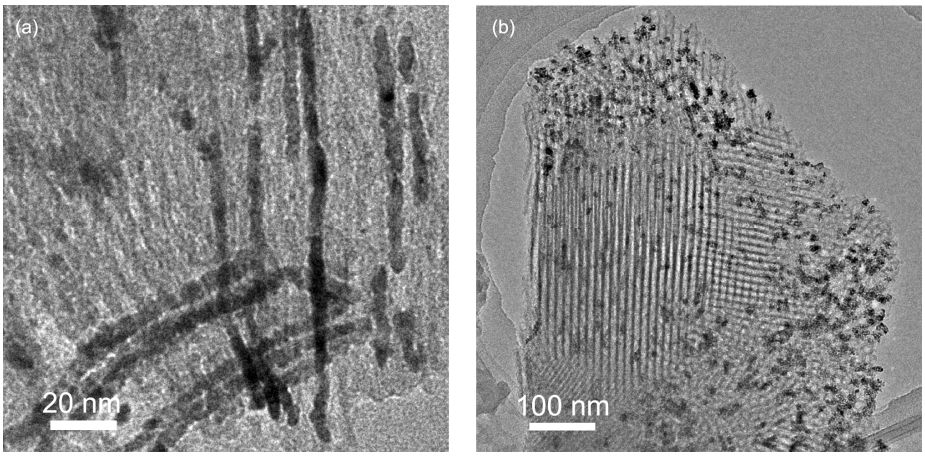

Figure S9 TEM images of mesoporous silica/Pt composite film prepared with tribock copolymer (P123) instead of $C_{16}EO_8$.

Figure S10

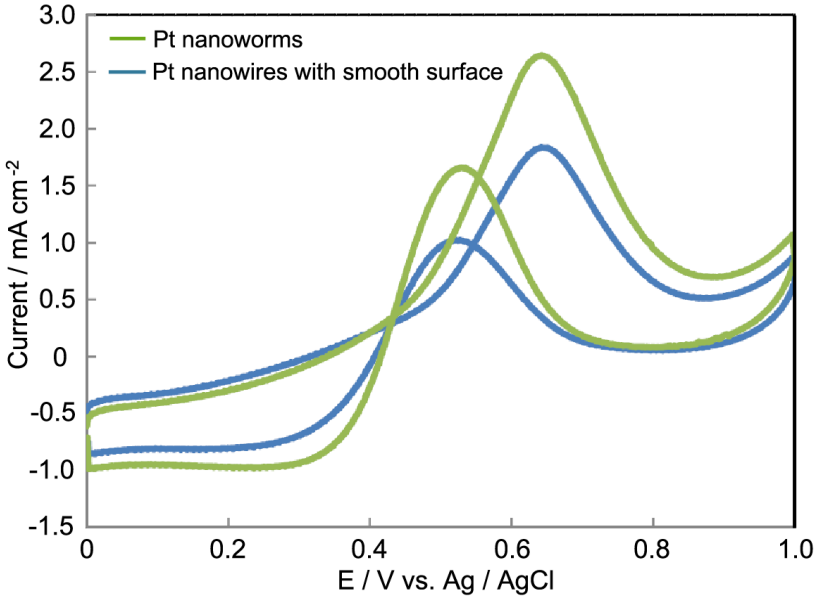

Figure S10 CV curves of methanol oxidation reaction. Cyclic voltammetry (CV) experiments were performed by using a conventional three-electrode cell, including an Ag/AgCl (saturated KCl) electrode as a reference electrode, a platinum wire as a counter electrode, and a modified glassy carbon electrode (GCE) (3 mm in diameter) as a working electrode. The bumpy or smooth nanowire suspension was dropped on the surface of the modified GCE and dried at room temperature. Then, methanol electro-oxidation measurements were performed in a solution of 0.5 M H_2SO_4 that contained 0.5 M methanol at a scan rate of 50 mV/s.