Supporting Information

Impact of Channel Nanostructures of Porous Carbon Particles on Their Catalytic Performance

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Supplementary Note 1

$$Amount\ of\ DAP\ produced = \frac{Absobance}{molar\ absorption\ coefficient\ *\ optical\ path\ length\ (cm)} \quad (1)$$

By applying the Beer-Lambert Law (equation (1)), the amount of DAP produced can be calculated from the UV-Vis spectrum (DAP's molar absorption coefficient = 1.67×10^4 $M^{-1}cm^{-1}$ and the optical path length = 1 cm).[1] As DAP at a concentration of 1 M is generated from the reactant OPD at 2 M, the residual concentration of OPD over time can be determined. Plotting 1/[OPD] against time results in a linear graph, where the slope of this line represents the second-order reaction rate constant, k ($mM^{-1}s^{-1}$), of OPD. The equation used for calculating 1/[OPD] is as follows:

$$\frac{1}{[OPD]} = \frac{1}{0.67\ mM - \left(\frac{Absorbance\ of\ DAP}{1.67\times10\ mM^{-1}cm^{-1}}\times 2\right)} \quad (2)$$

This equation assumes the conversion of 2OPD to DAP and sets a total concentration of 0.67 mM, where the total concentration is based on 100 μL of 0.02 M OPD in 3 mL.

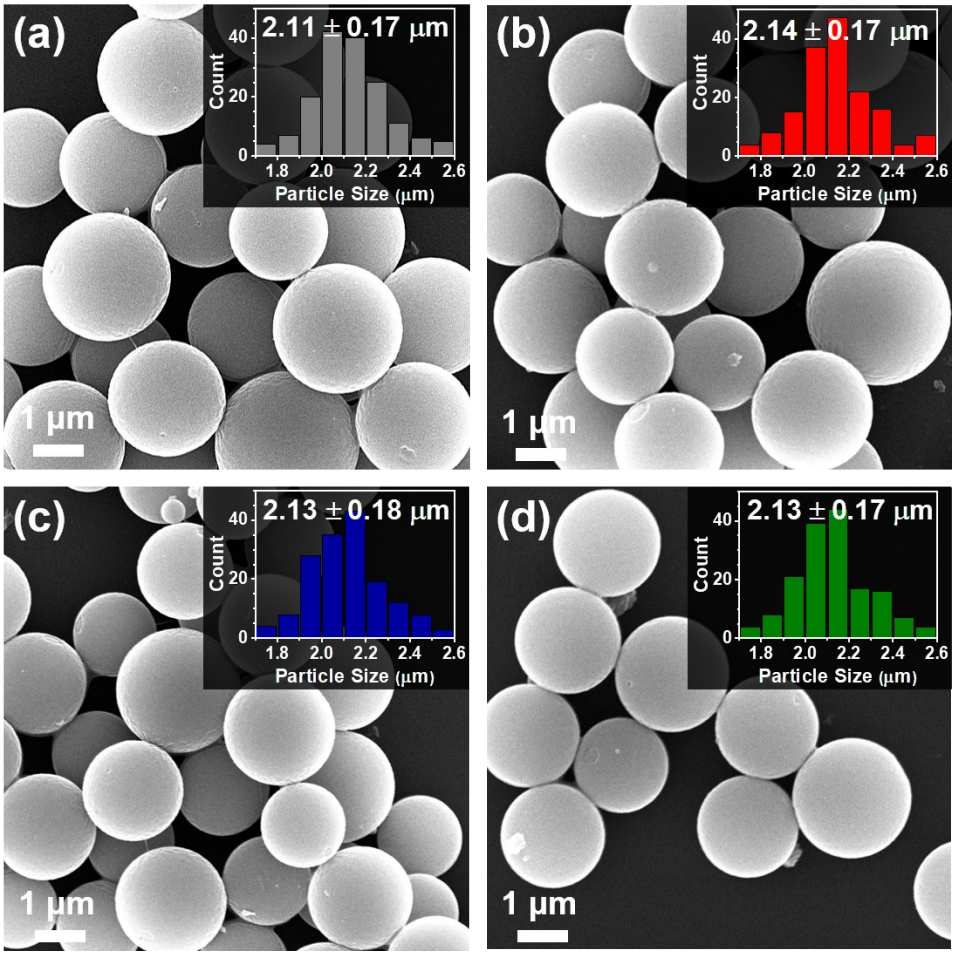

Fig. S1 SEM images of BCP particles at different chloroform evaporation conditions. (a) φ = 0.04 h^{-1}, (b) φ = 0.09 h^{-1}, (c) φ = 0.33 h^{-1}, (d) φ = 1.18 h^{-1}.

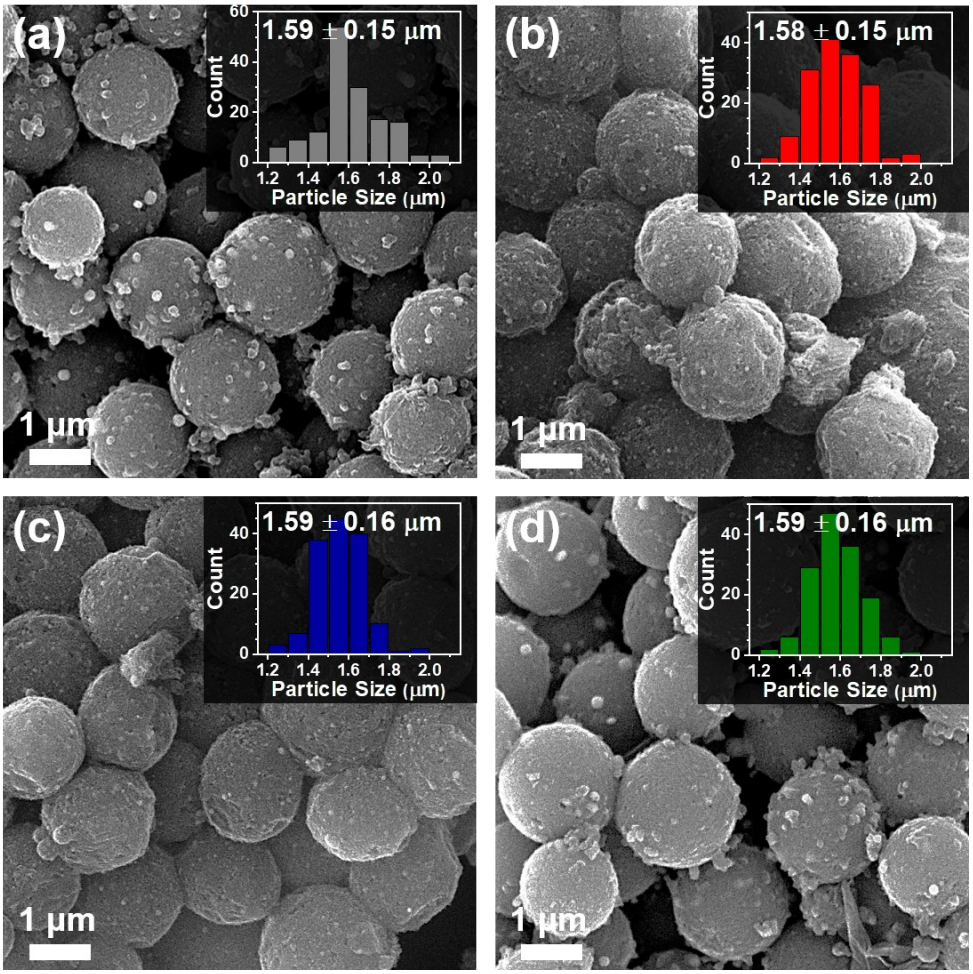

Fig. S2 SEM images of (a) PCP1, (b) PCP2, (c) PCP3 and (d) PCP4.

Table S1. Structural characteristics of PCP determined by BET measurement.

PCP	BET surface area (m^2 g^{-1})	Pore volume (cm^3 g^{-1})	Pore diameter (nm)
PCP1	208	0.23	6.6
PCP2	314	0.35	37.9
PCP3	393	0.46	38.8
PCP4	562	0.69	37.3

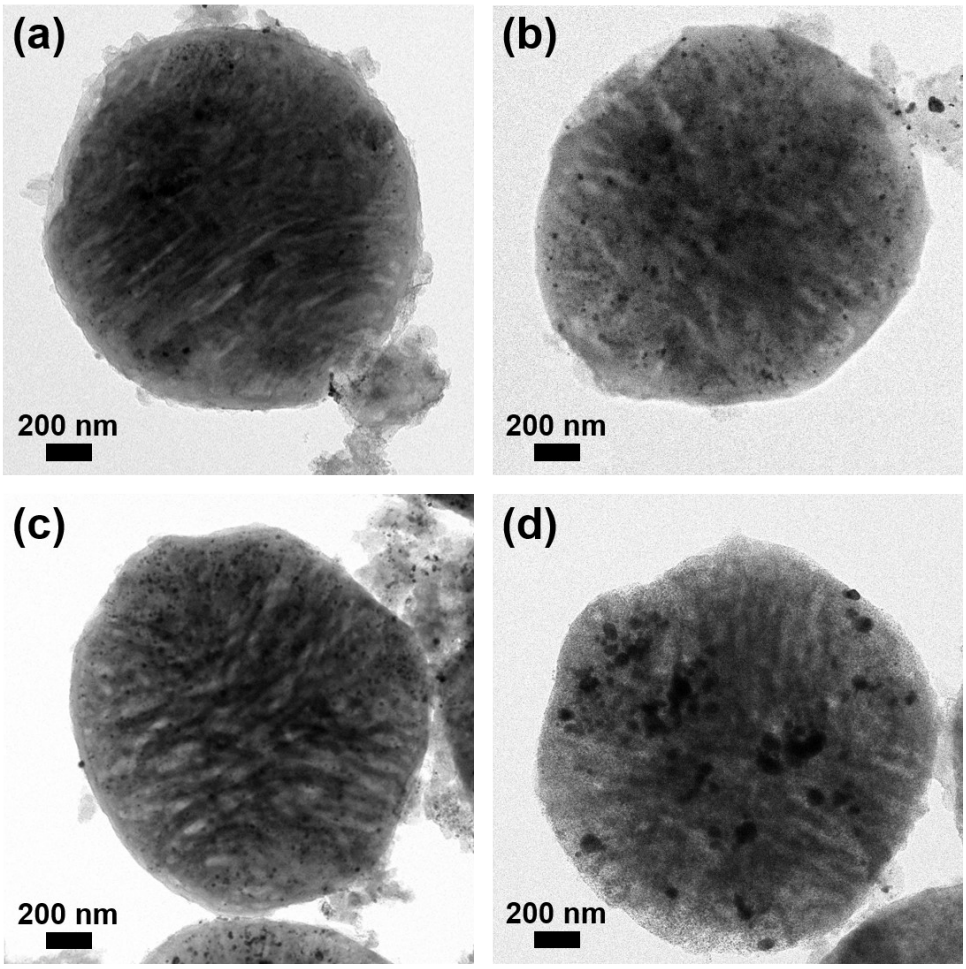

Fig. S3 TEM images of PCP-PtFe catalysts: (a) PCP1-PtFe, (b) PCP2-PtFe, (c) PCP3-PtFe, and (d) PCP4-PtFe.

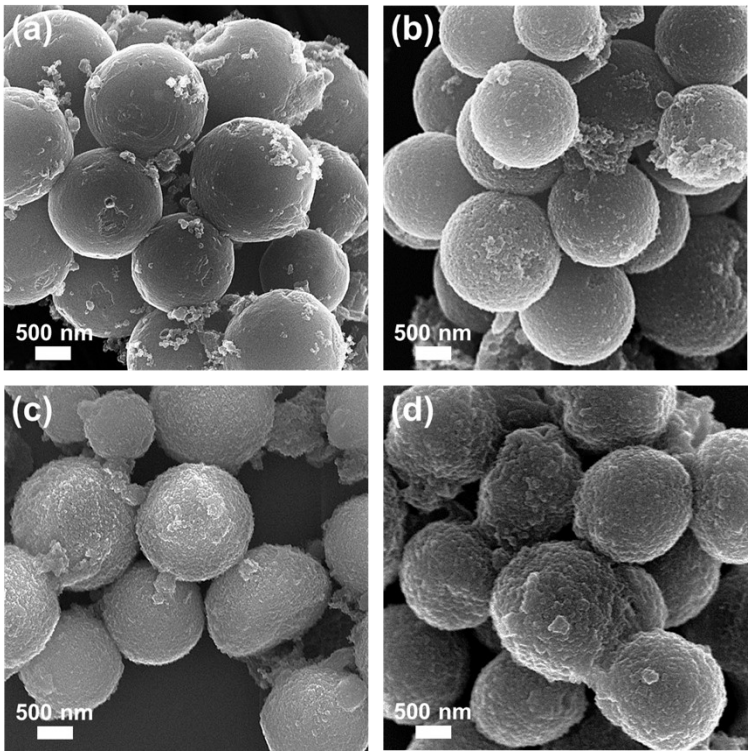

Fig. S4 SEM images of PCP-PtFe catalysts: (a) PCP1-PtFe, (b) PCP2-PtFe, (c) PCP3-PtFe, and (d) PCP4-PtFe.

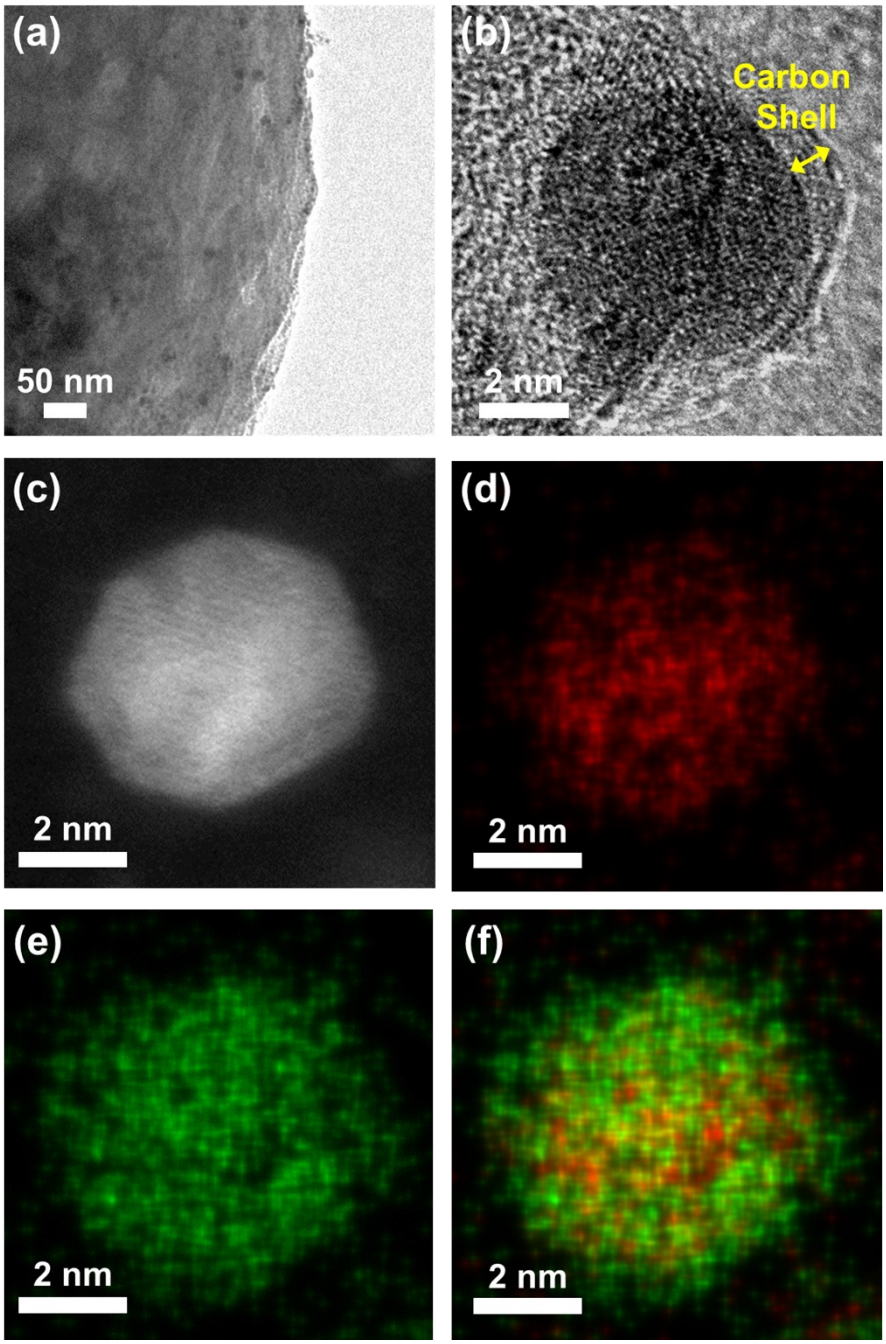

Fig. S5 (a) TEM image, (b) high-resolution TEM image, (c) HAADF-STEM image, and (d-f) EDS mapping of the PCP4-PtFe catalyst: (d) Pt (red), (e) Fe (green), and (f) their overlay. The observed ratio of Pt and Fe is 1:3.

Table S2. Elemental analysis of PCP-PtFe catalyst measured by ICP-OES.

Catalyst	Pt (wt%)	Fe (wt%)
PCP1-PtFe	1.31	4.74
PCP2-PtFe	1.32	4.57
PCP3-PtFe	1.37	4.79
PCP4-PtFe	1.29	4.76

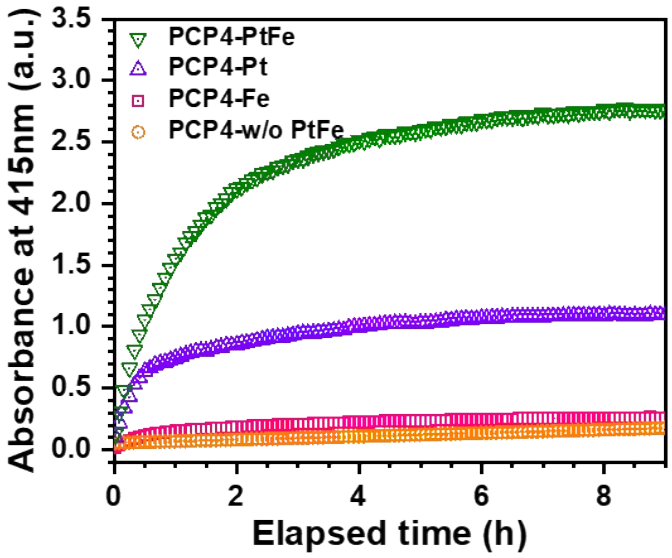

Fig. S6 UV-Vis absorption spectra of PCP4-PtFe catalyst, PCP4-Pt, PCP4-Fe, and PCP4-w/o PtFe for OPD oxidation.

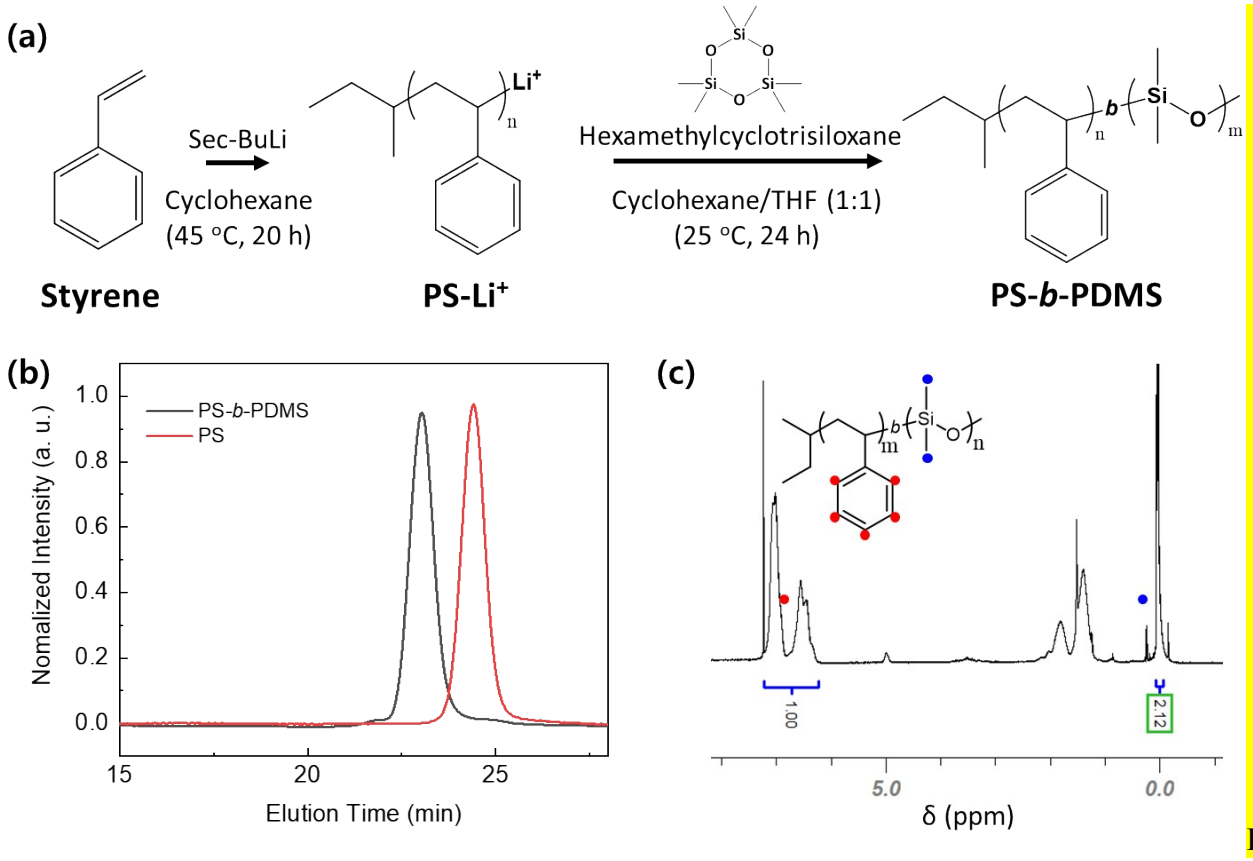

Fig. S7 (a) Scheme for the anionic polymerization, (b) SEC, and (c) ^{1}H NMR spectra of PS-*b*-PDMS.

Reference

1. F. Vetr, Z. Moradi-Shoeili, S. Özkar, *Appl. Organomet. Chem.* **2018,** *32*, e4465.