Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Materials

Synthesis of catalysts with fine platinum particles supported by high-surface-area activated carbons and optimization of their catalytic activities for polymer electrolyte fuel cells

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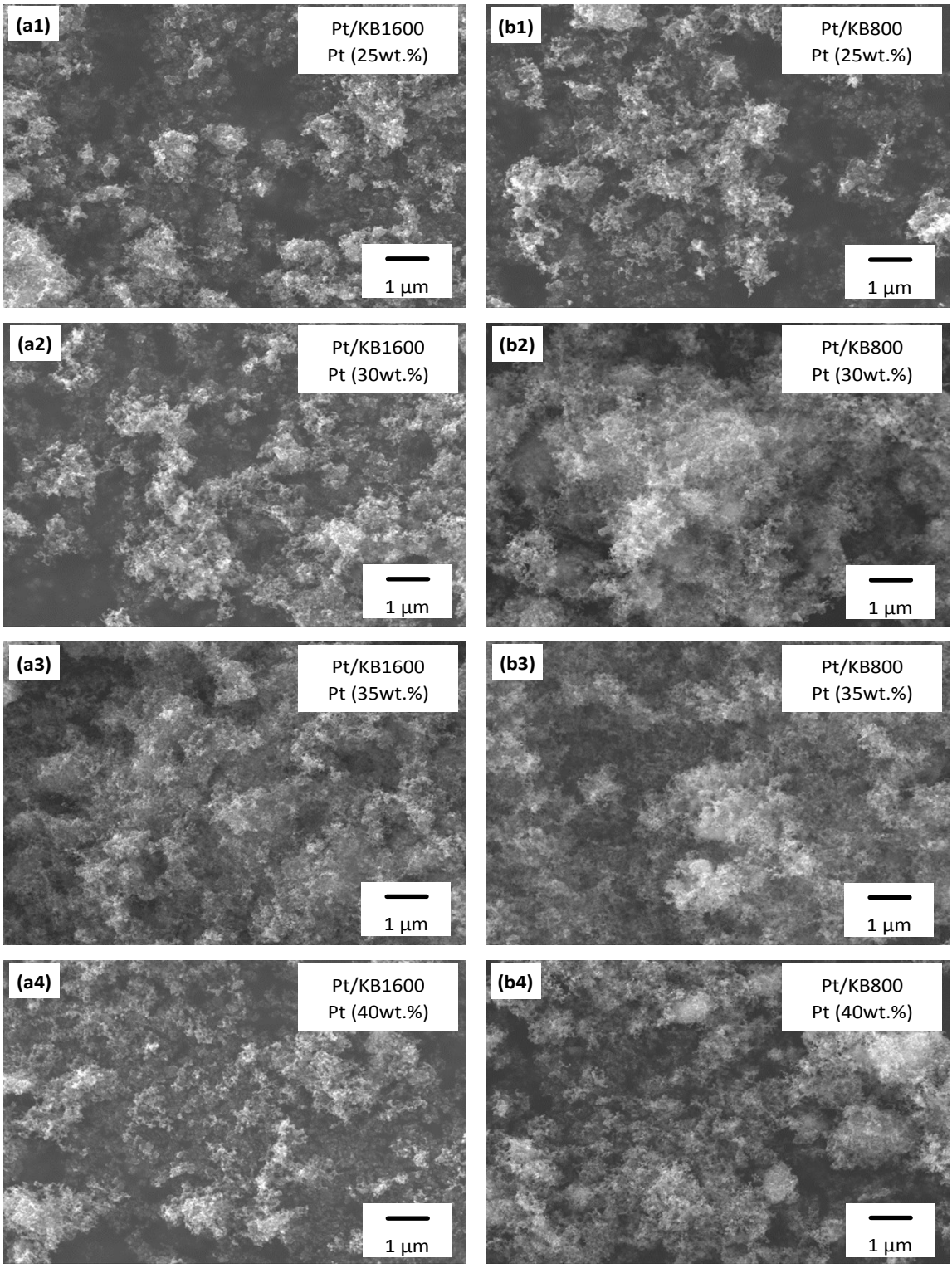

Fig. S1 SEM images of the Pt/KB1600 and Pt/KB800 catalyst with different Pt loading of (a1 - a4) 25 - 40 wt.%, and (b1 - b4) 25 - 40 wt.%, respectively.

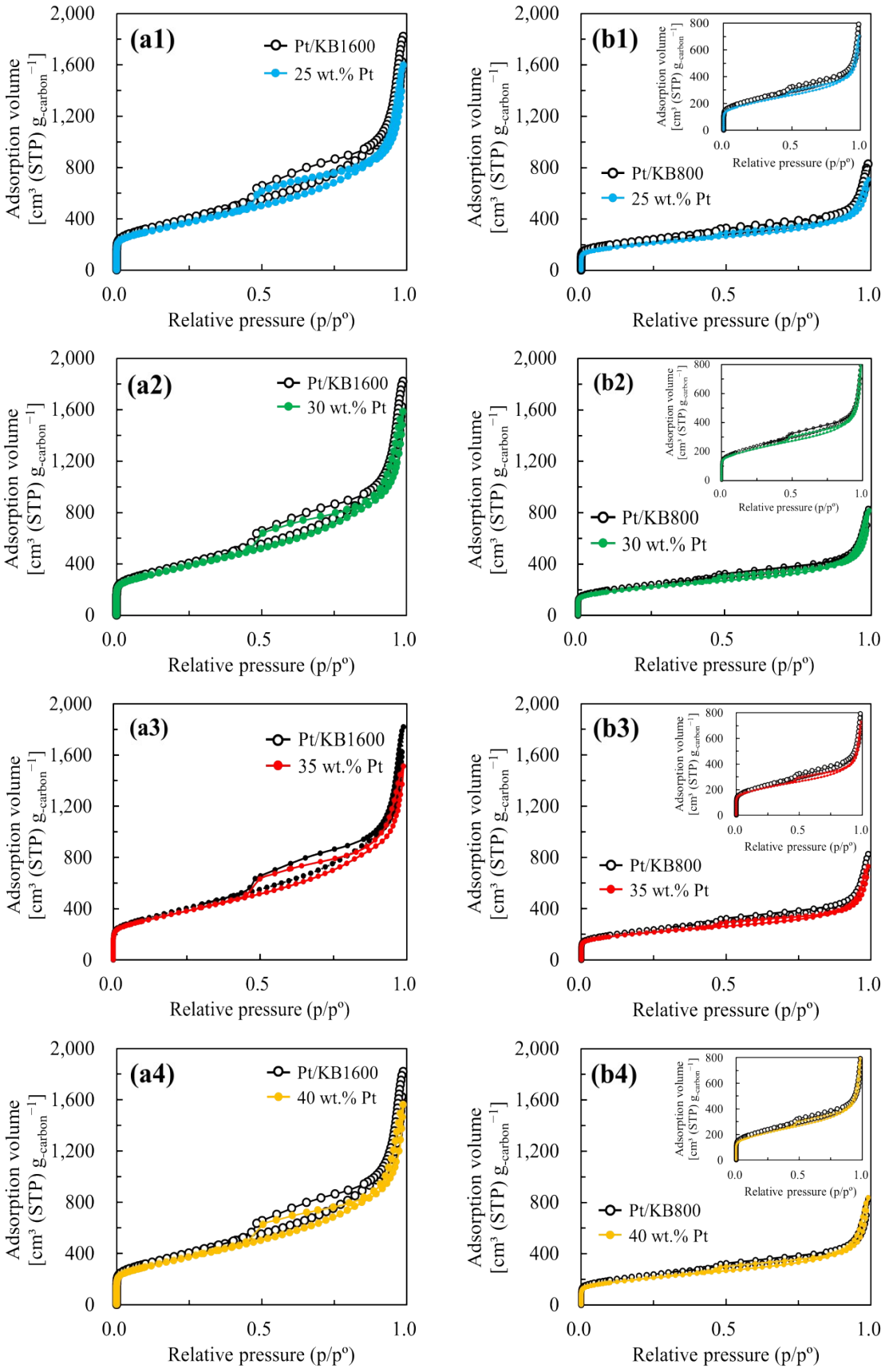
(a1)
Pt/KB1600
25 wt.% Pt
(b1)
Pt/KB800
25 wt.% Pt
(a2)
Pt/KB1600
30 wt.% Pt
(b2)
Pt/KB800
30 wt.% Pt
(a3)
Pt/KB1600
35 wt.% Pt
(b3)
Pt/KB800
35 wt.% Pt
(a4)
Pt/KB1600
40 wt.% Pt
(b4)
Pt/KB800
40 wt.% Pt
Adsorption volume [cm³ (STP) g-carbon⁻¹]
Relative pressure (p/p°)
0.0
0.5
1.0
0
400
800
1,200
1,600
2,000
200
600

Fig. S2 Nitrogen adsorption desorption isotherms of two different carbon support and carbon-supported Pt catalysts (Pt/KB1600 and Pt/KB800) with different Pt loading of (a1 - a4) 25 - 40 wt.%, and (b1 - b4) 25 - 40 wt.%, respectively.

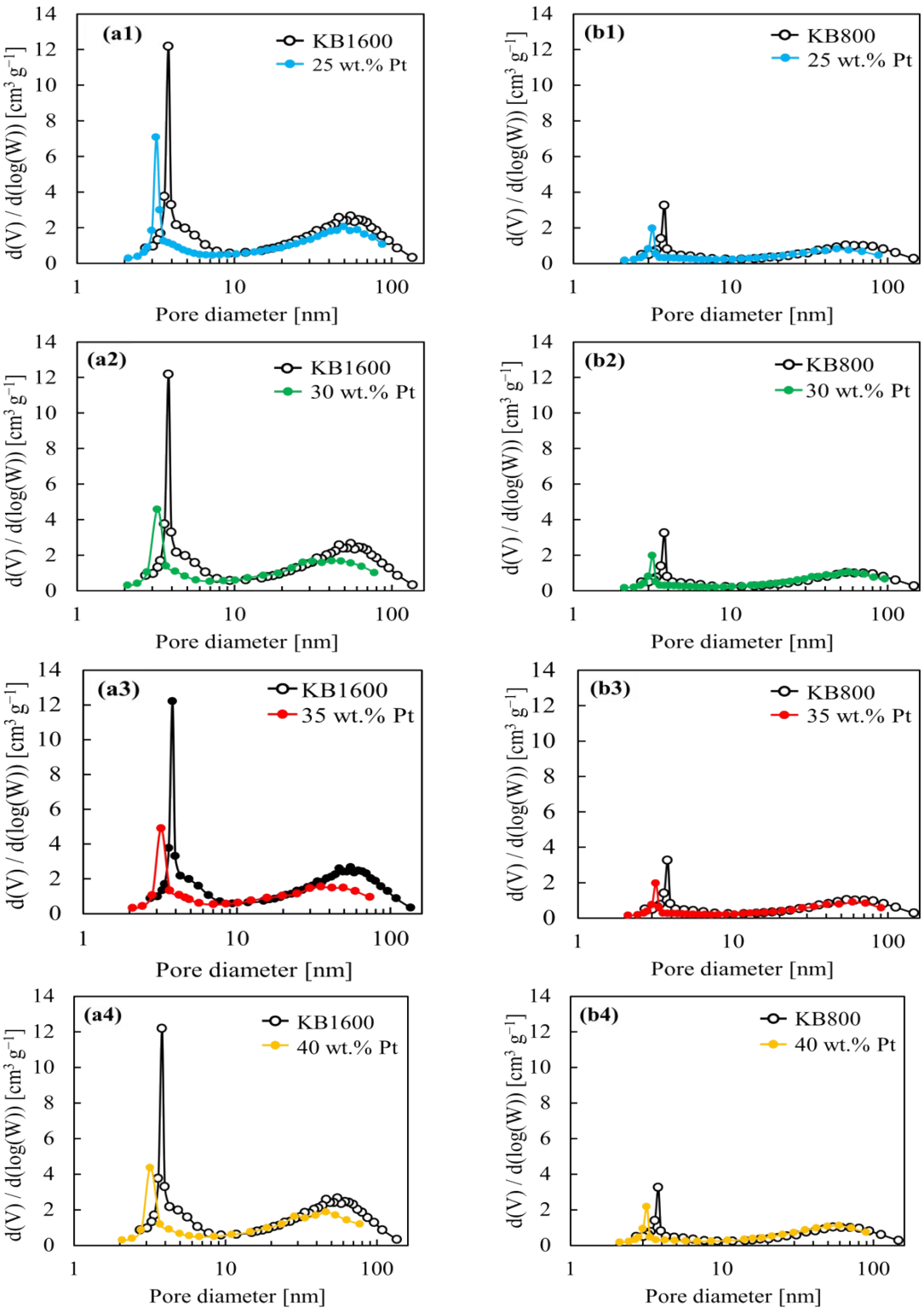

Fig. S3 Pore size distribution of carbon supports, Pt/KB1600 and Pt/KB800 catalyst with Pt loadings of (a1 - a4) 25 - 40 wt.%, and (b1 - b4) 25 - 40 wt.%, respectively.

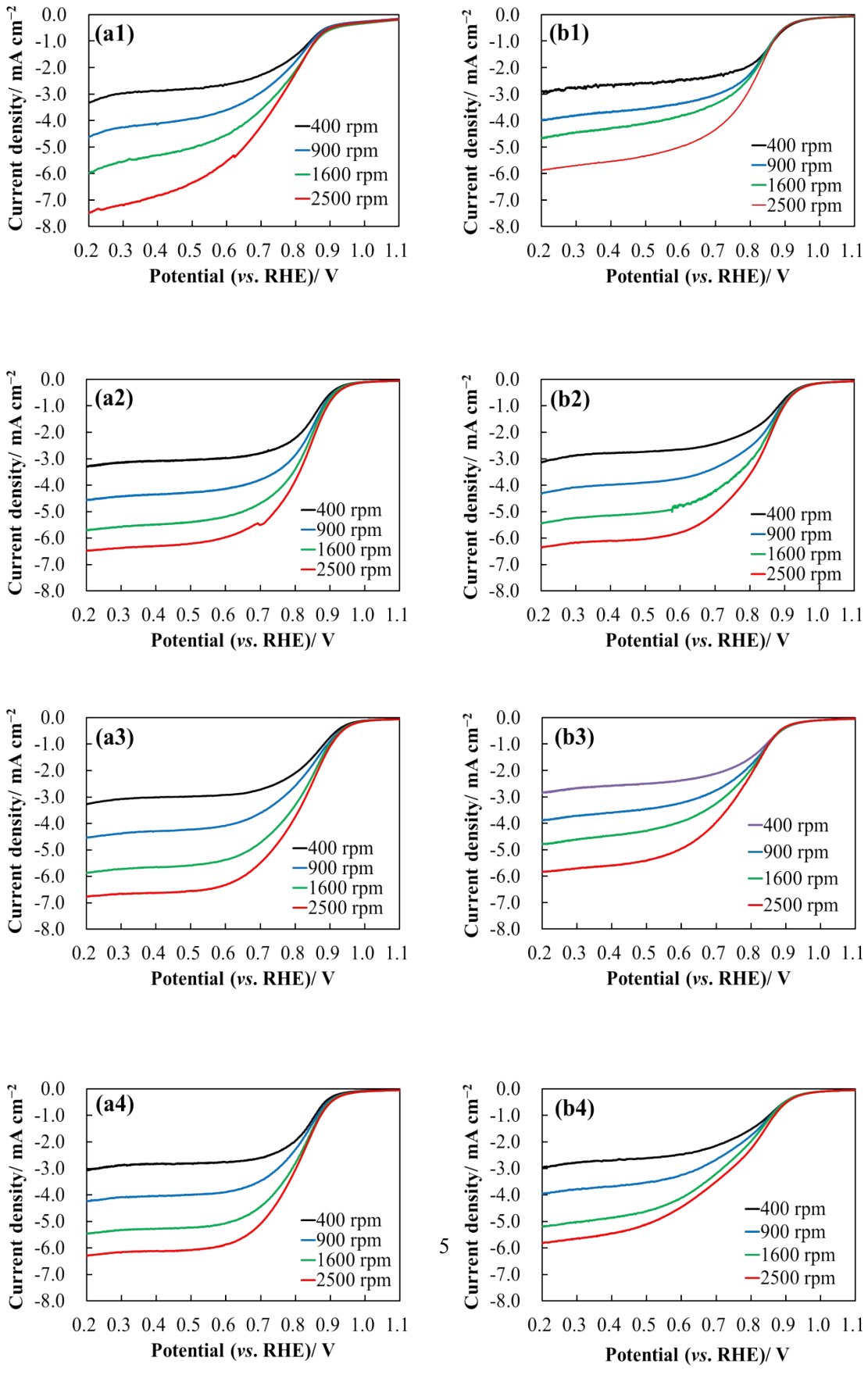

Fig. S4 ORR polarization curves of (a1) 25 wt.% Pt/KB1600, (a2) 30 wt.% Pt/KB1600, (a3) 35 wt.% Pt/KB1600, (a4) 40 wt.% Pt/KB1600, (b1) 25 wt.% Pt/KB800, (b2) 30 wt.% Pt/KB800, (b3) 35 wt.% Pt/KB800, and (b4) 40 wt.% Pt/KB800 catalyst recorded at RT in 0.1 M $HClO_4$ solution.

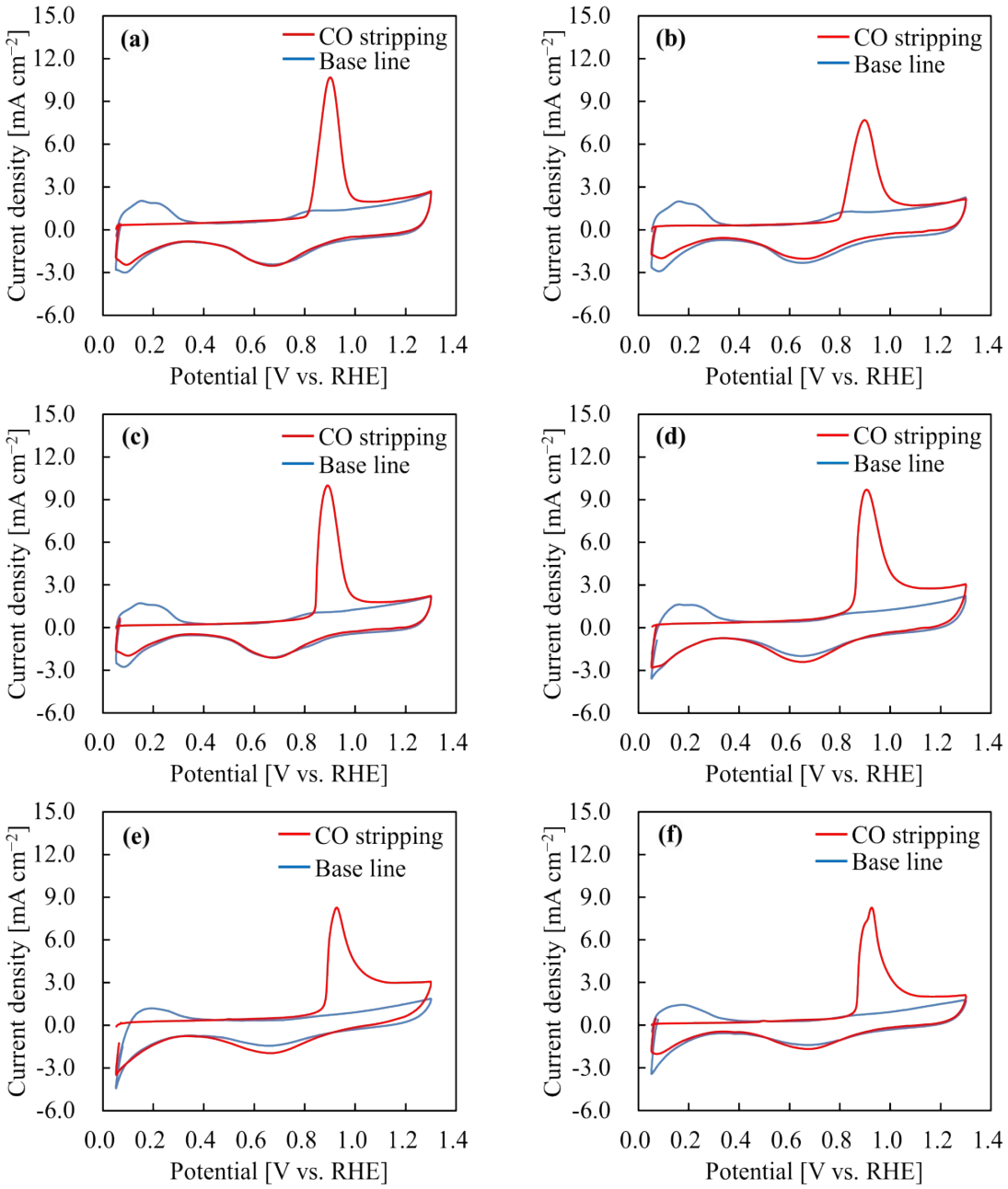

Fig. S5 CO stripping voltammograms for (a) 25wt.% Pt/KB1600, (b) 30wt.% Pt/KB1600, (c) 40wt.% Pt/KB1600, (d) 25wt.% Pt/KB800, (e) 35wt.% Pt/KB800 and (f) 40wt.% Pt/KB800 catalyst.