

Electronic Supplementary Information

**Facile Solvothermal Synthesis of Pt<sub>1.2</sub>Co/C Bimetallic Nanocrystals as Efficient Electrocatalysts for Methanol Oxidation and Hydrogen Evolution Reaction**

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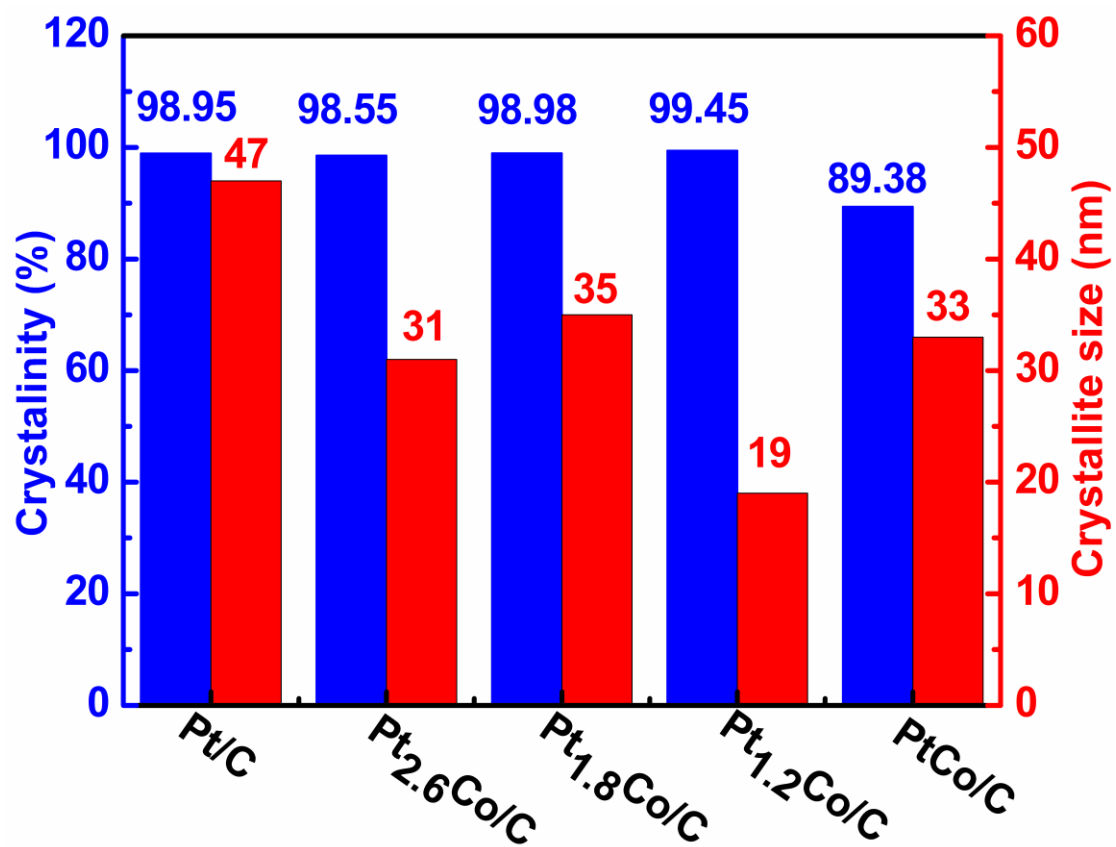


Figure S1. Crystallinity and crystallite size of Pt<sub>x</sub>Co<sub>y</sub> nanoalloys in the as-synthesized Pt<sub>x</sub>Co<sub>y</sub>/C electrocatalysts.

Table S1. The atom ratio of Pt/Co determined by the inductively coupled plasma atomic emission spectroscopy (ICP-AES)

Sample	Alloy mass loading (wt%)	Pt content (mg/kg)	Co content (mg/kg)	Pt/Co atom ratio
Pt <sub>2.6</sub> Co/C	19.874	177962.300	20774.100	2.548
Pt <sub>1.8</sub> Co/C	17.222	147556.000	24661.900	1.780
Pt <sub>1.2</sub> Co/C	16.527	131759.010	33511.680	1.190
Pt <sub>1.2</sub> Co/C after stability test for 1000s	13.728	127477.000	9799.200	3.869
PtCo	16.348	158420.200	50567.500	1.055

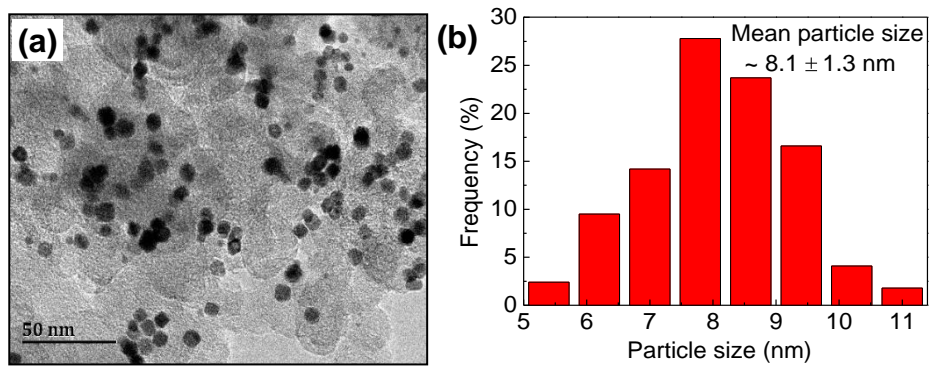


Figure S2. (a) TEM image and (b) histograms of particle size distribution of as-synthesized Pt/C catalyst sample.

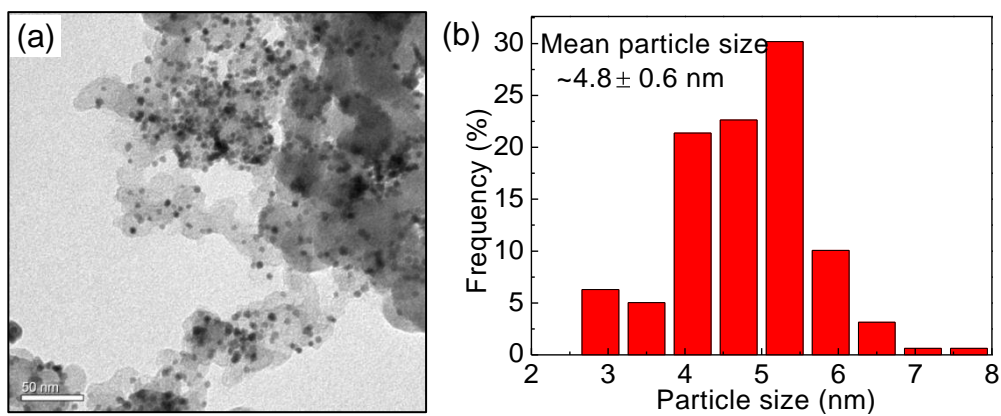


Figure S3. (a) TEM image and (b) histograms of particle size distribution of as-synthesized Pt<sub>2.6</sub>Co/C catalyst sample.

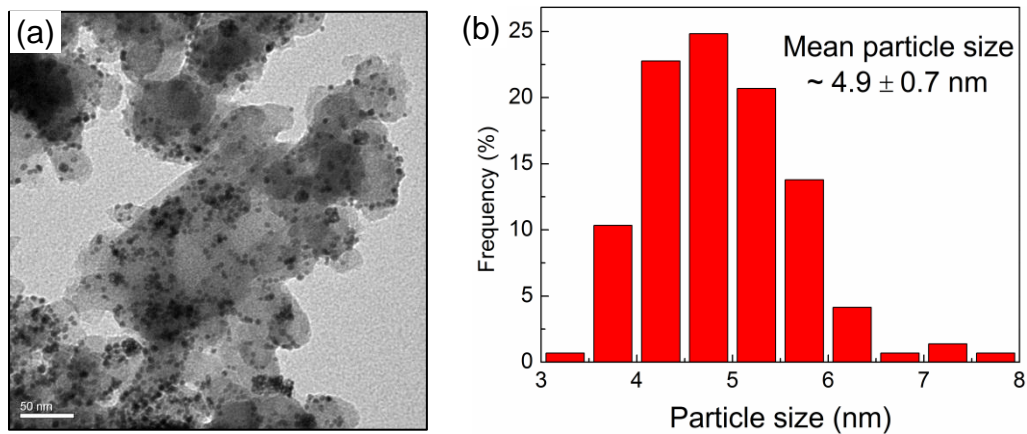


Figure S4. (a) TEM image and (b) histograms of particle size distribution of as-synthesized Pt<sub>1.8</sub>Co/C catalyst sample.

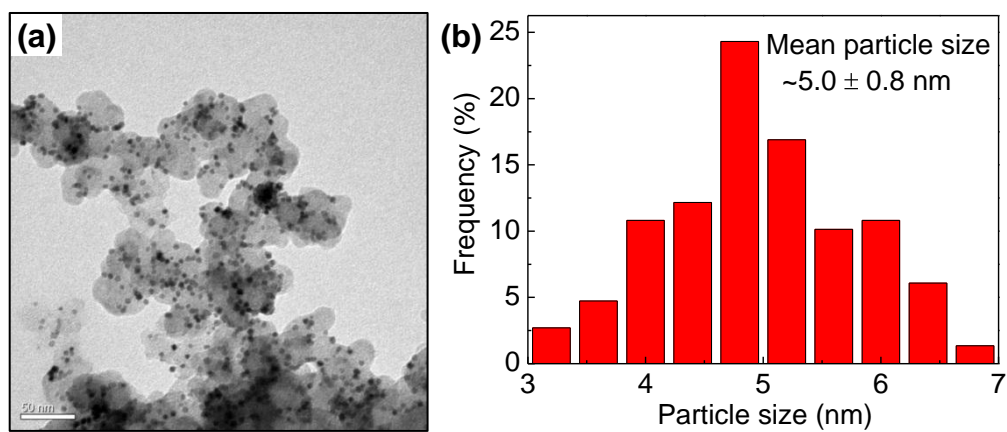


Figure S5. (a) TEM image and (b) histograms of particle size distribution of as-synthesized PtCo/C catalyst sample.

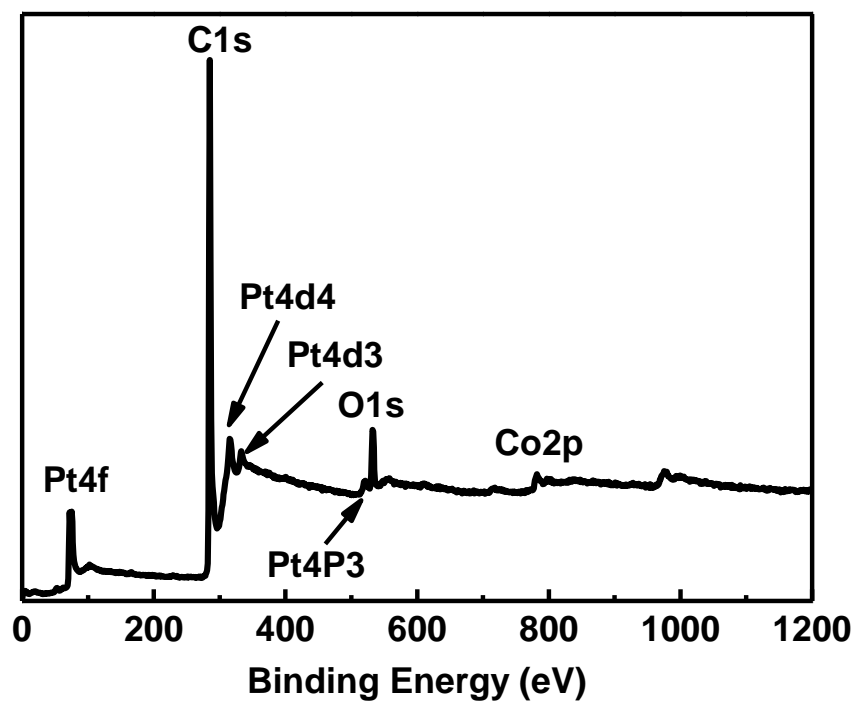


Figure S6. XPS survey spectrum of Pt<sub>1.2</sub>Co/C.



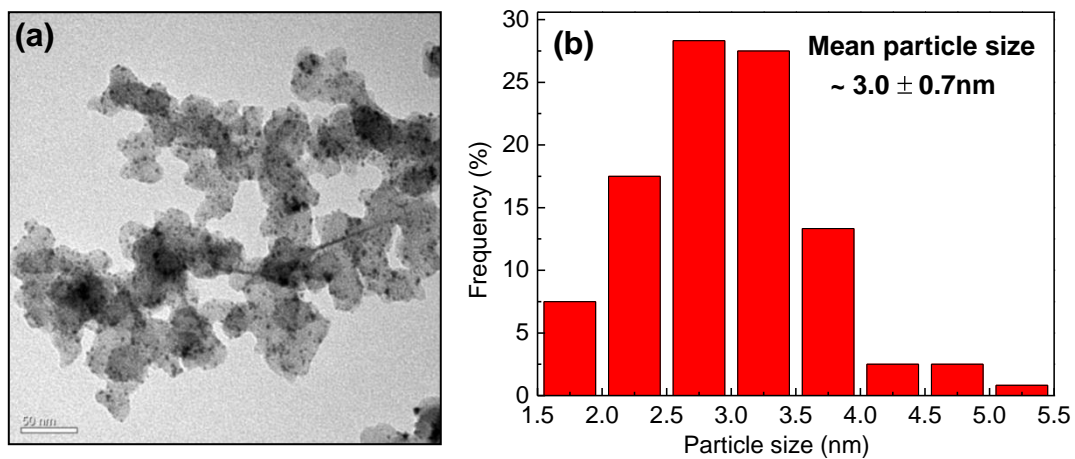


Figure S7. (a) Typical TEM image and (b) histograms of particle size distribution of Johnson Matthey (JM) commercial Pt/C catalyst.

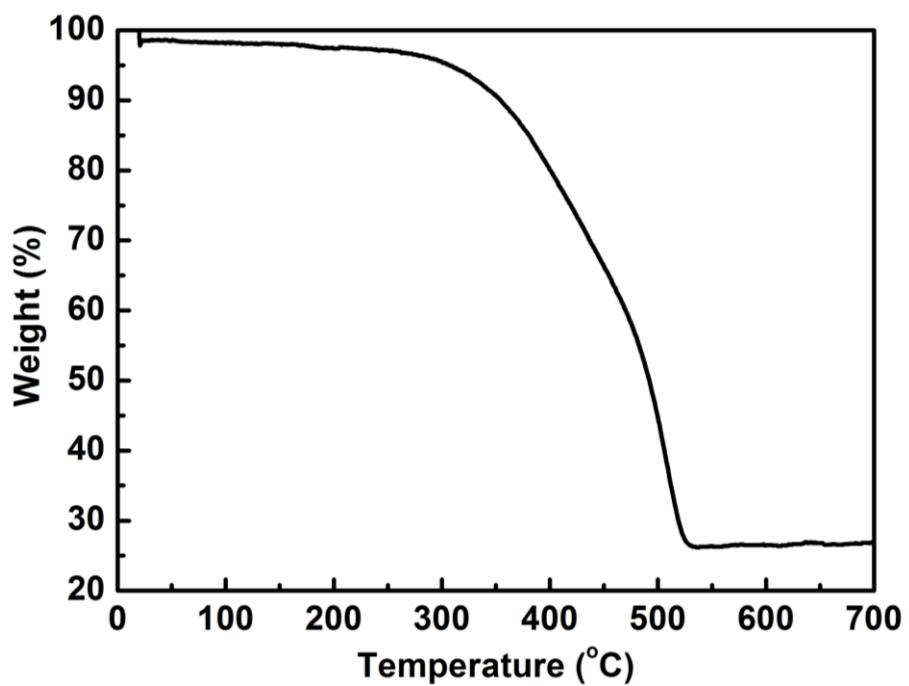


Figure S8. Thermal gravimetric (TG) curve of Pt<sub>1.2</sub>Co/C at a heating rate of 5°C/min.

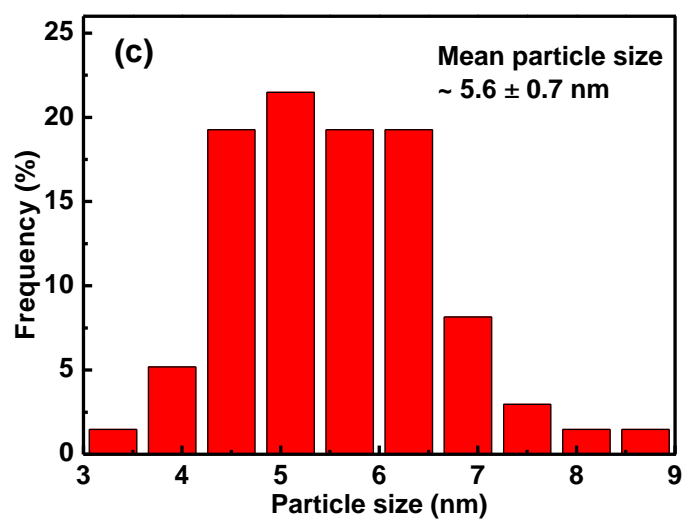
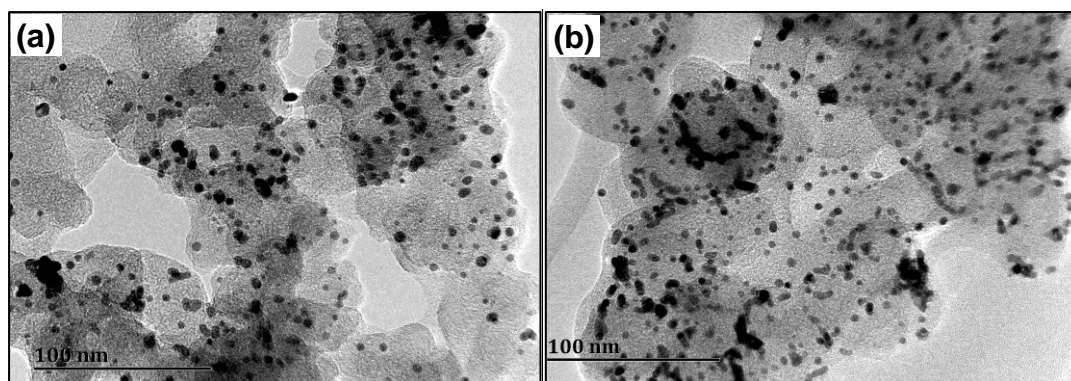


Figure S9. TEM images (a, b) and histograms of particle size distribution (c) of Pt<sub>1.2</sub>Co/C catalyst after stability evaluation for 3000s in 0.5 M H<sub>2</sub>SO<sub>4</sub> with 1.0 M methanol.