Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Structure and size control of FePtCu nanocatalyst for high performance hydrogen evolution reaction

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Figure S1

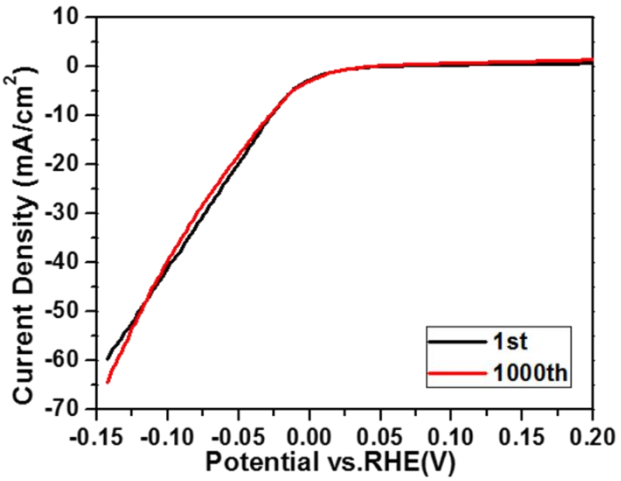

Fig. S1. The polarization curves of the $L1_0$ ordered $Fe_{45}Pt_{35}Cu_{20}$ nanoparticles before and after 1000 cycles in 0.5 M H_2SO_4 electrolyte saturated with N_2. These $L1_0$ ordered $Fe_{45}Pt_{35}Cu_{20}$ nanoparticles were fabricated by using $FeCl_2$ as the iron source.

Figure S2

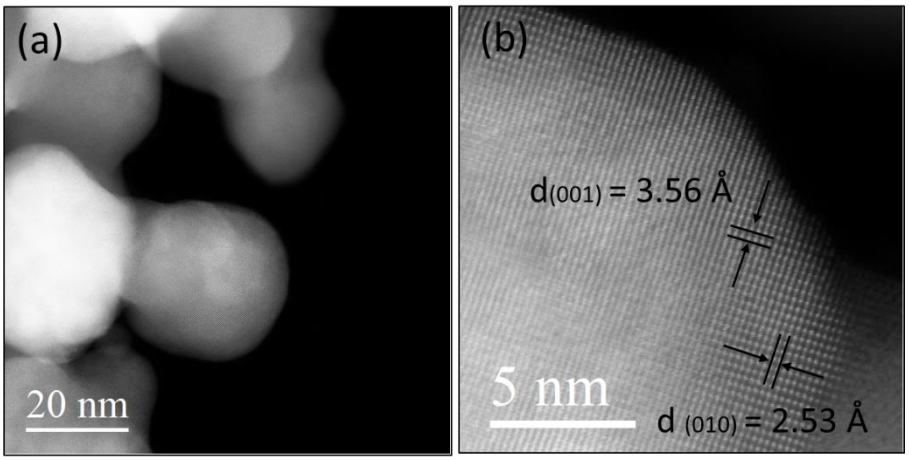

Fig. S2. (a) The HAADF-STEM image of the $L1_0$ ordered $Fe_{45}Pt_{35}Cu_{20}$ nanoparticles obtain by using $FeCl_2$ as the iron source. (b) High resolution-STEM image of one typical nanoparticles in (a).

Figure S3

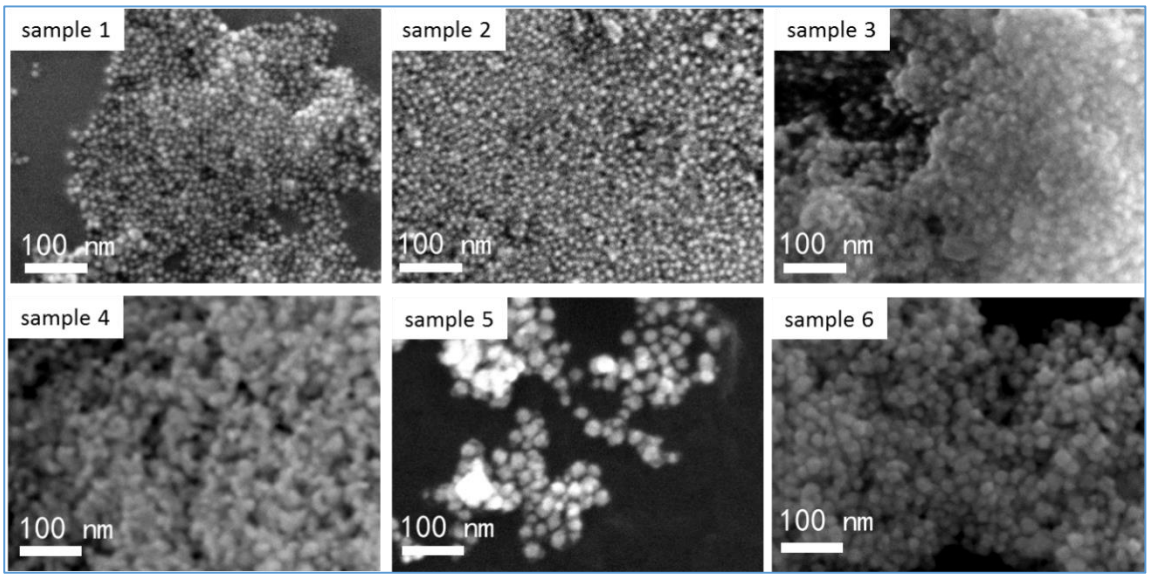

Fig. S3. High-resolution SEM images of powder sample of S1-S6. The images reveal that the size and morphology of the $Fe_{45}Pt_{35}Cu_{20}$ nanoparticles are influenced by the $FeCl_2$/$Fe(acac)_3$ ratio in precursors.

Figure S4

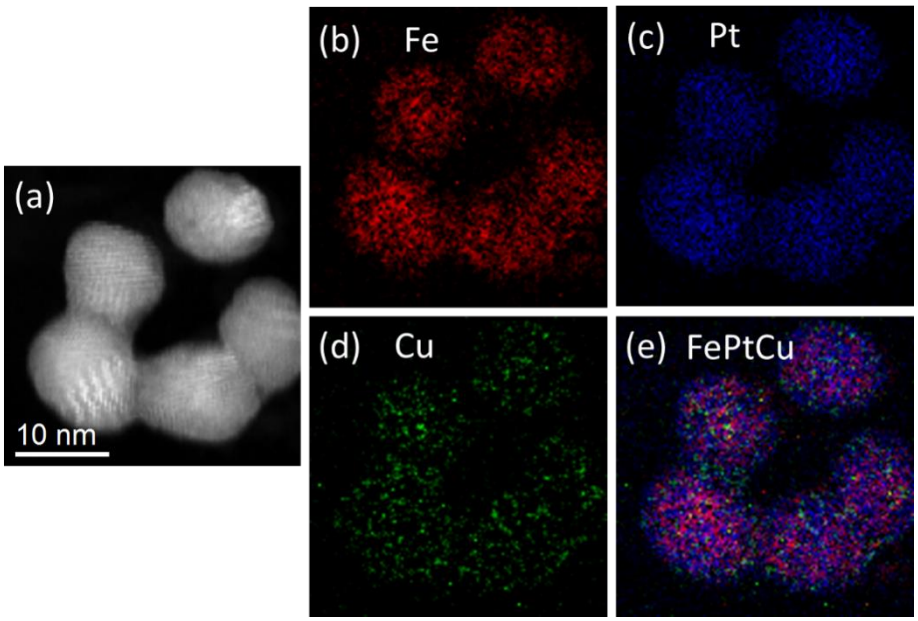

Fig. S4. The STEM image (a) and corresponding EDS mappings (b-e) of smaller $Fe_{45}Pt_{35}Cu_{20}$ nanoparticles in Sample S4.

Table S1

Materials	overpotential [mV]	Tafel slope [mV decade^{-1}]	Reference
FePt35Cu (Sample 4)	10	24	This work
Pt/C	30	30	This work
AuPt nano dendrites	39	34	1
Au_1Pt_3	211	49	1
Pt-Ag/silicon nanowires	135	70	2
Pt@Te nanoparticles	100	55	3
$Pt_{76}Co_{24}$ nanomyriapods	45	32	4
$Pt_{80}Co_{20}$ nanomyriapods	36	37	4
Pd@PdPt	39	38	5
PdPt alloy	50	38	5
PtNiCu	/	28	6
PtCu	/	29	6
$Pt_{81}Fe_{28}Co_{10}$ TriStar	/	21	7
$Pt_{81}Fe_{28}Co_8$ TriStar	/	22	7

Comparison of the HER performance of $Fe_{45}Pt_{35}Cu_{20}$ nanoparticles with results presented by other literatures in acidic conditions.

Reference

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