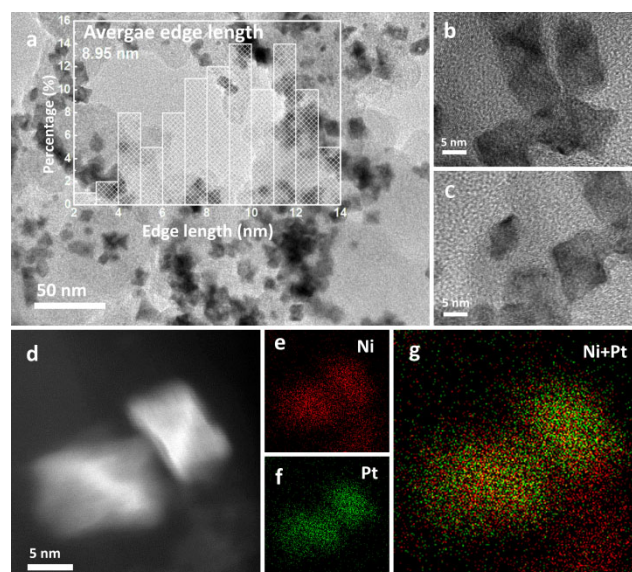# Electronic Supplementary Material

Fig. S1 Morphology and elemental distribution of annealed$_{Ar}$ PtNi$_{3.5}$ NPs.

(a) TEM image; (b) and (c) HR-TEM images; (d) HAADF-STEM image; (e) STEM EDX-mapping of Ni; (f) STEM EDX-mapping of Pt; (g) STEM EDX-mapping of composite Ni versus Pt.

Table S1 Fitting results of XPS from the Ni 2p core level regions of as-prepared PtNi$_{3.5}$, acid-treated Pt$_3$Ni, the annealed$_{5\% H_2}$ PtNi$_{3.5}$, acid-treated annealed$_{5\% H_2}$ Pt$_{2.1}$Ni, and annealed$_{5\% H_2}$ acid-treated Pt$_3$Ni

Sample	Position (2p$_{3/2}$) / eV				Ni^{2+}/Ni^0
	Ni^0	Ni^{2+}	Ni^0, sat	Ni^{2+}, sat	
As-prepared PtNi$_{3.5}$/C	852.41	855.87	857.32	860.61	2.0
Acid-treated Pt$_3$Ni/C	853.17	856.54	859.53	863.39	1.1
Annealed$_{5\% H_2}$ PtNi$_{3.5}$/C	852.93	855.67	857.75	861.09	1.8
Acid-treated annealed$_{5\% H_2}$ Pt$_{2.1}$Ni/C	853.09	856.38	859.54	863.21	0.5
Annealed$_{5\% H_2}$ acid-treated Pt$_3$Ni/C	853.02	856.30	860.64	864.82	1.5

Table S2 Fitting results of XPS from Pt 4f core level regions of as-prepared PtNi$_{3.5}$, acid-treated Pt$_3$Ni, annealed$_{5\% H_2}$ PtNi$_{3.5}$, acid-treated annealed$_{5\% H_2}$ Pt$_{2.1}$Ni, and annealed$_{5\% H_2}$ acid-treated Pt$_3$Ni

Sample	Position (4f$_{5/2}$) / eV			Pt^0/PtO$_x$
	Pt^0	Pt^{2+}	Pt^{4+}	
As-prepared PtNi$_{3.5}$/C	71.10	71.98	74.63	1.1
Acid-treated Pt$_3$Ni/C	71.57	72.57	74.88	1.5
Annealed$_{5\% H_2}$ PtNi$_{3.5}$/C	71.72	72.79	75.02	1.5
Acid-treated annealed$_{5\% H_2}$ Pt$_{2.1}$Ni/C	71.71	72.79	75.04	1.5
Annealed$_{5\% H_2}$ acid-treated Pt$_3$Ni/C	71.76	72.77	75.02	1.0