Electronic Supplementary Information

Control of Composition in Pt-Ni Electrocatalysts Using Surfactant-Free Synthesis in Neat N-Formylpiperidine

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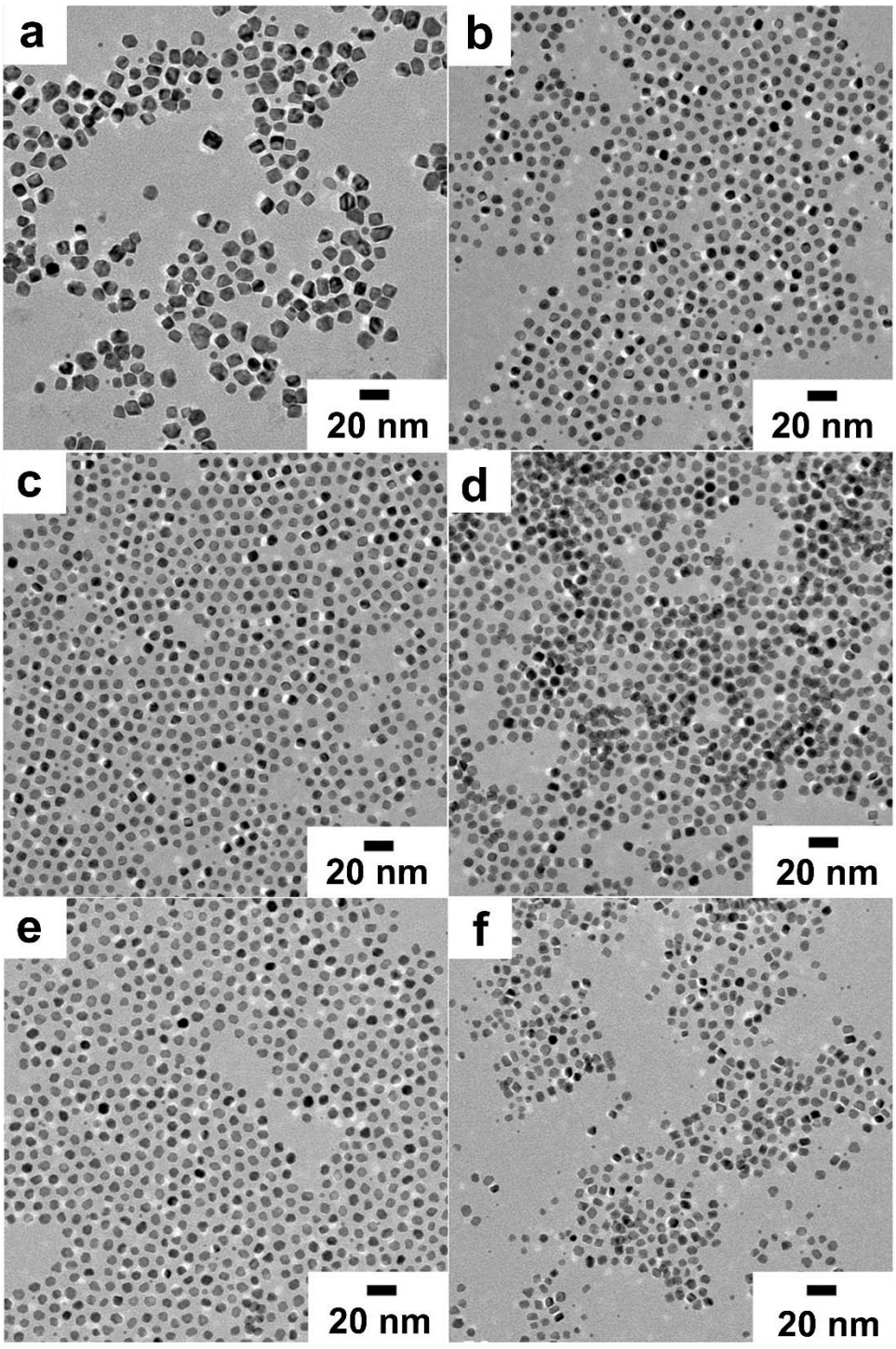

Fig. S1 TEM micrographs showing large area of Pt-Ni alloy nanoparticles with different duration of exposure to CO gas: (a) 0, (b) 2, (c) 4, (d) 10, (e) 20 and (f) 60 min, respectively.

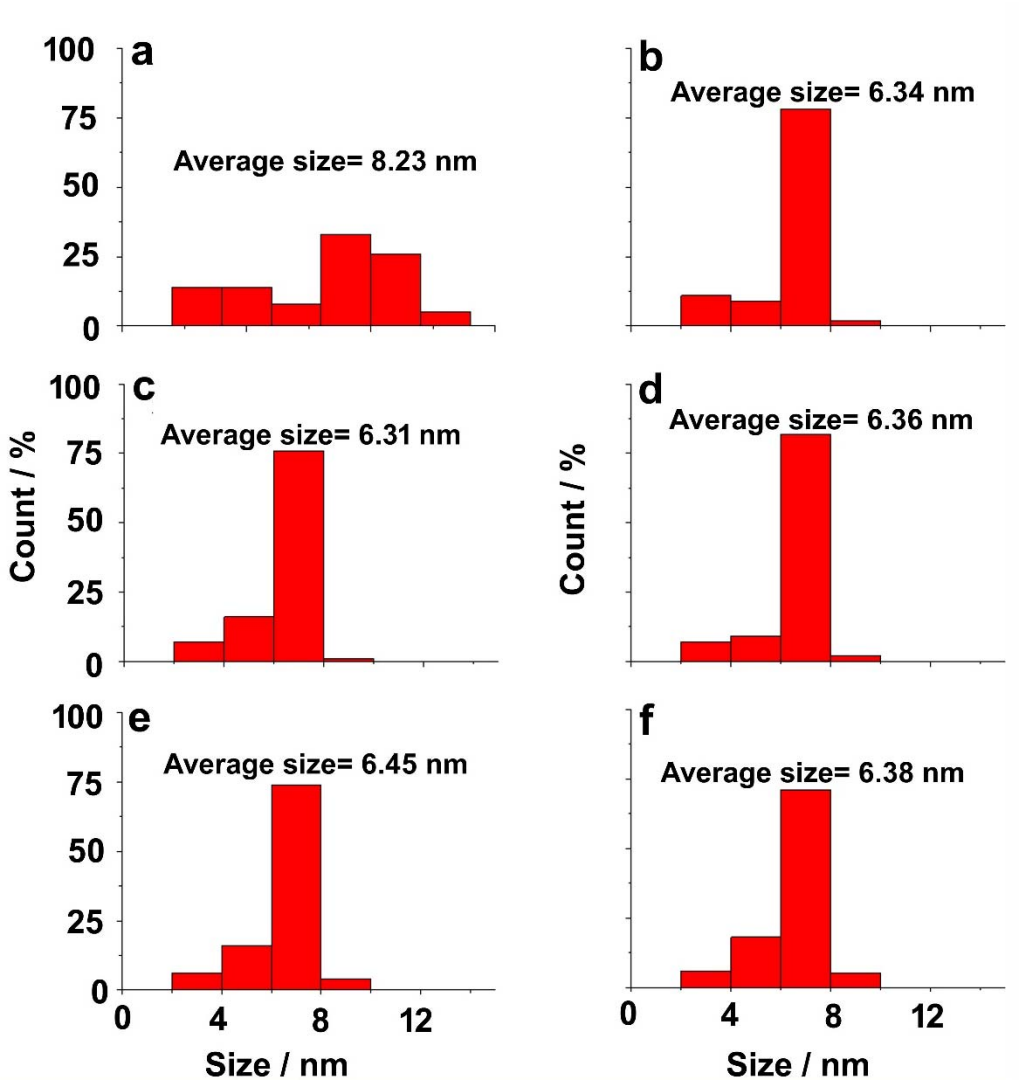

Fig. S2 Histograms of size distribution calculated based on the TEM images shown in Fig. S1. The samples were exposed to CO gas for a time period of (a) 0, (b) 2, (c) 4, (d) 10, (e) 20 and (f) 60 min, respectively.

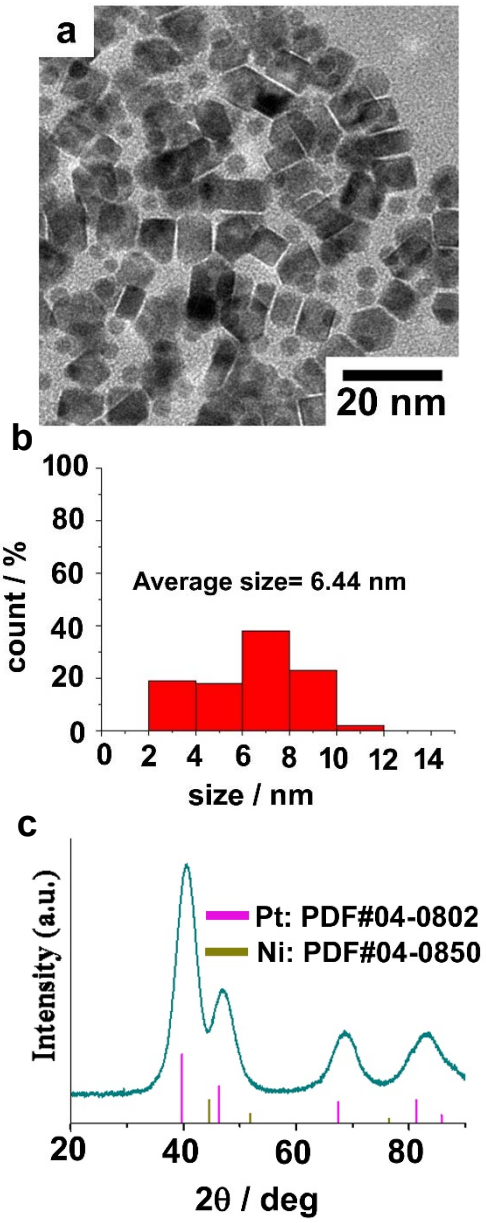

Fig. S3 (a) TEM micrograph, (b) size distribution analysis and (c) XRD pattern of the Pt-Ni alloy nanoparticles with exposure to CO gas for the last 50 min of reaction.

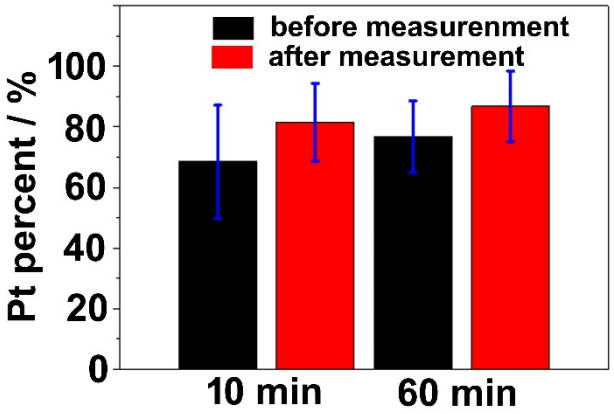

Fig. S4 Composition of Pt-Ni alloy nanoparticles made with exposure to CO gas for 10 and 60 min before and after electrochemical tests. The composition was based on the EDX spot analysis acquired under STEM-HAADF mode on JEOL 2010F STEM with field emission gun at 200 kV with an Oxford INCA 30 mm ATW detector. Fifty spots were sampled for every specimen and their average values were presented in this figure.

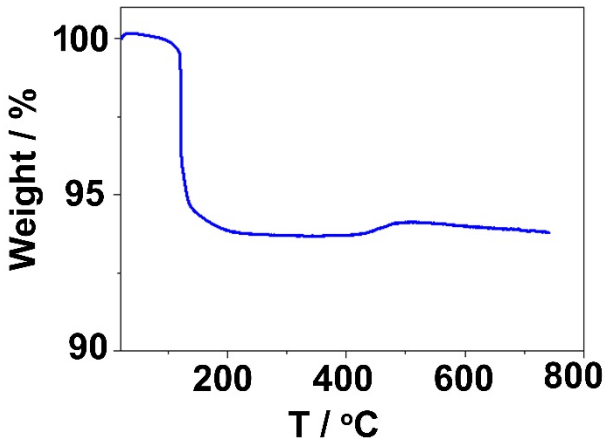

Fig. S5 TGA curve of unsupported Pt-Ni alloy nanoparticles made with exposure to CO gas for 10 min.

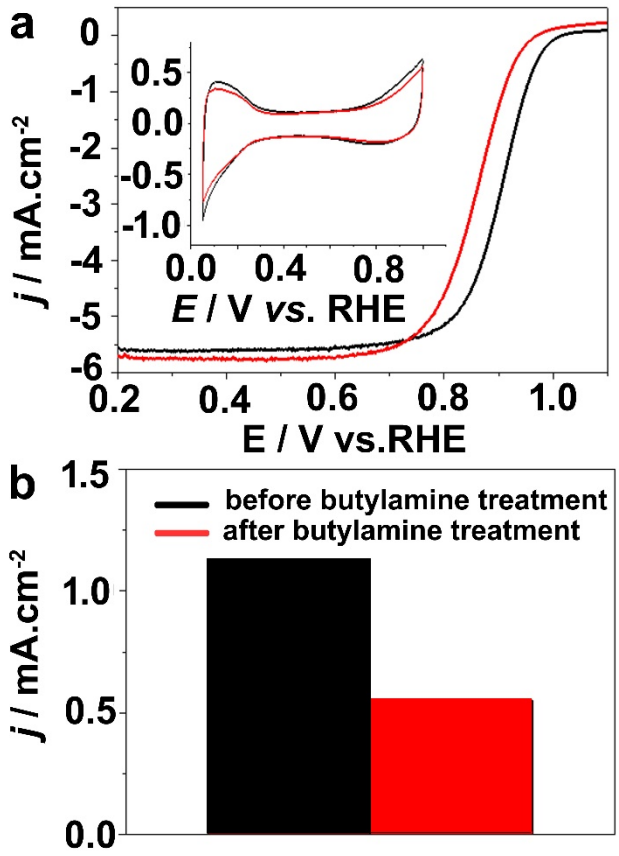

Fig. S6 (a) Polarization and (b) current density of carbon-supported Pt-Ni nanoparticle catalysts before and after the treatment with butylamine. The sample was made with the duration of exposure to CO gas for 10 min. Inset in (a) shows the CV curves.

Table S1 Pt/Ni atomic ratio of various Pt-Ni nanoparticle catalysts determined based on ICP analysis

t (min)*	Pt/Ni atomic ratio
0	2.7
2	3.0
4	2.8
10	2.8
20	2.7
60	3.3

*: Exposure time to CO gas during the synthesis.