

Supporting Information

Pt-Ni Seed-Core-Frame Hierarchical Nanostructures and Their Conversion to Nanoframes for Enhanced Methanol Electro-Oxidation

Shutang Chen ¹, Haibin Wu ¹, Jing Tao ², Huolin Xin ³, Yimei Zhu ², and Jingyi Chen ^{1,*}

¹Department of Chemistry and biochemistry, University of Arkansas, Fayetteville, AR 72701

²Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory, Upton, NY 11973

³Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY 11973

*Correspondence: chenj@uark.edu; Tel.: +1-479-575-6203

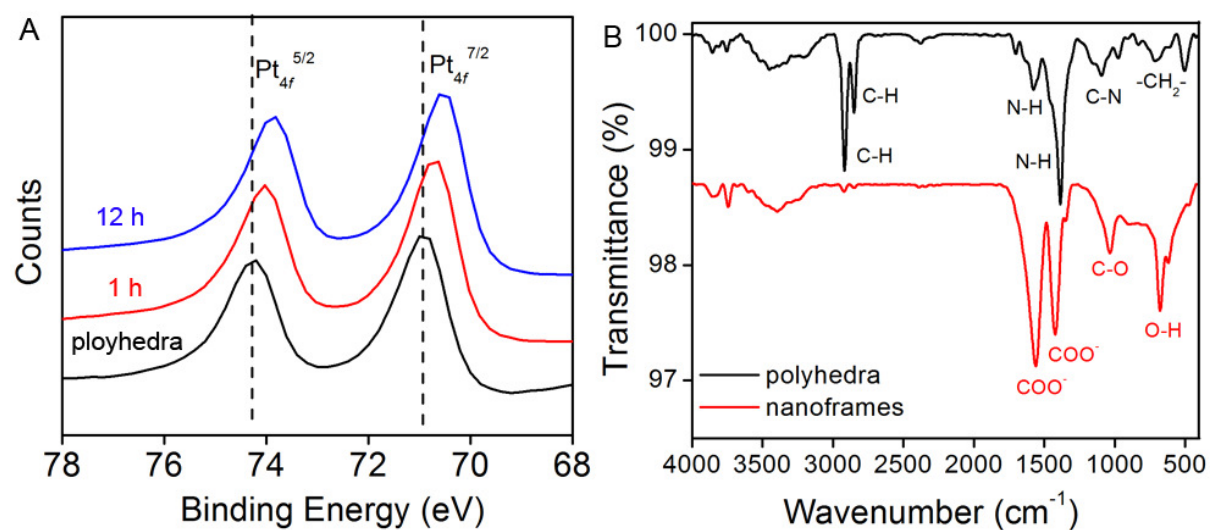


Figure S1. (A) XPS of the samples collected at 0, 1, and 12 h. (B) Fourier transform infrared (FTIR) spectra of OLA/HDA-capped polyhedral and acetic acid-capped nanoframes.

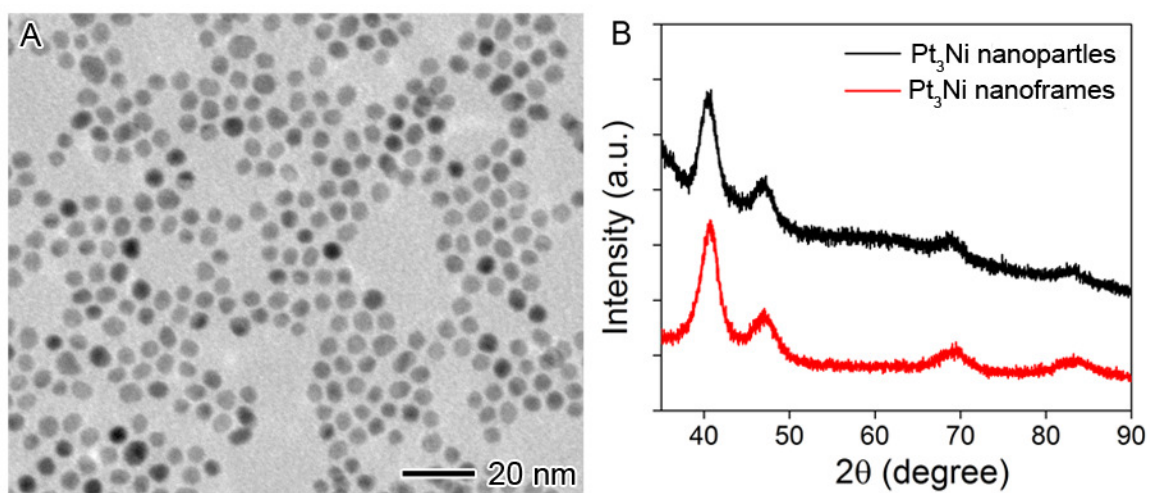


Figure S2. (A) TEM image of Pt₃Ni nanoparticles with an average diameter of ~6 nm; and (B) XRD patterns of the sample in (A) and its comparison nanoframes as shown in Figure 4.

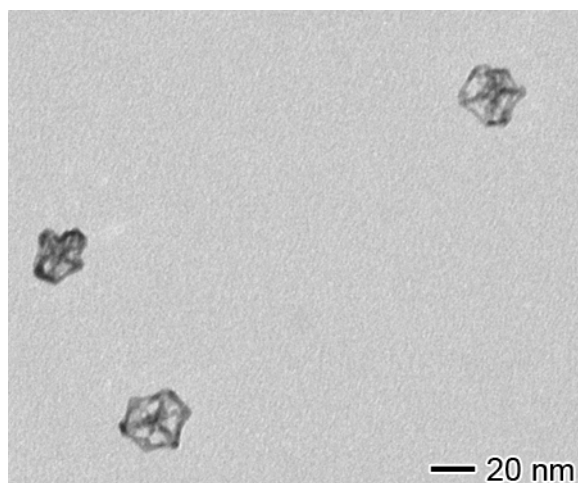


Figure S3. TEM image of Pt₃Ni nanoframes after 250 cycles. The atomic absorption result indicates a Pt/Ni ratio of 79:21.

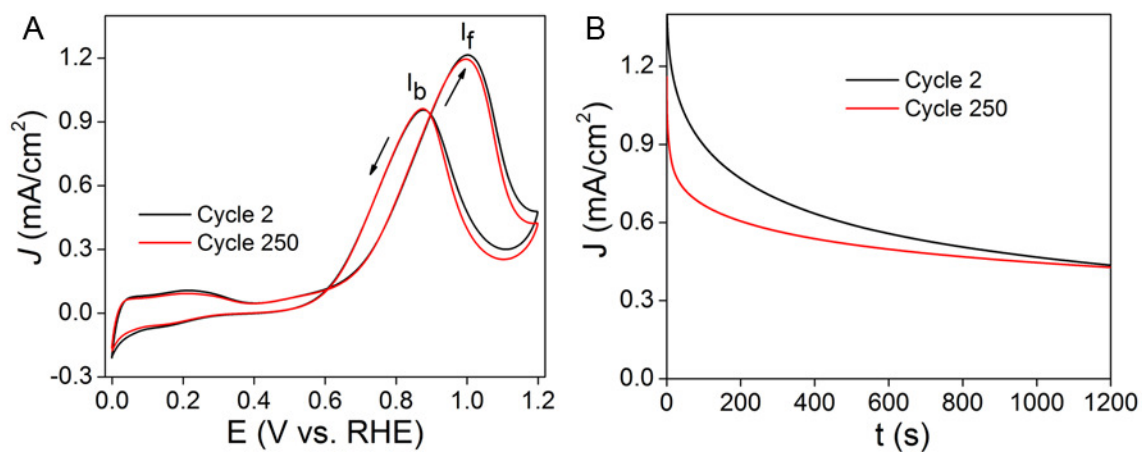


Figure S4. Electrochemical characterization of methanol oxidation on Pt₃Ni nanoframes in a solution containing 1 M CH₃OH and 0.1 M HClO₄ at a scan rate of 50 mV/s: (A) cyclic voltammetry (CV), and (B) chronoamperometry (CA). The CA curves were obtained at 0.90 V vs. RHE.