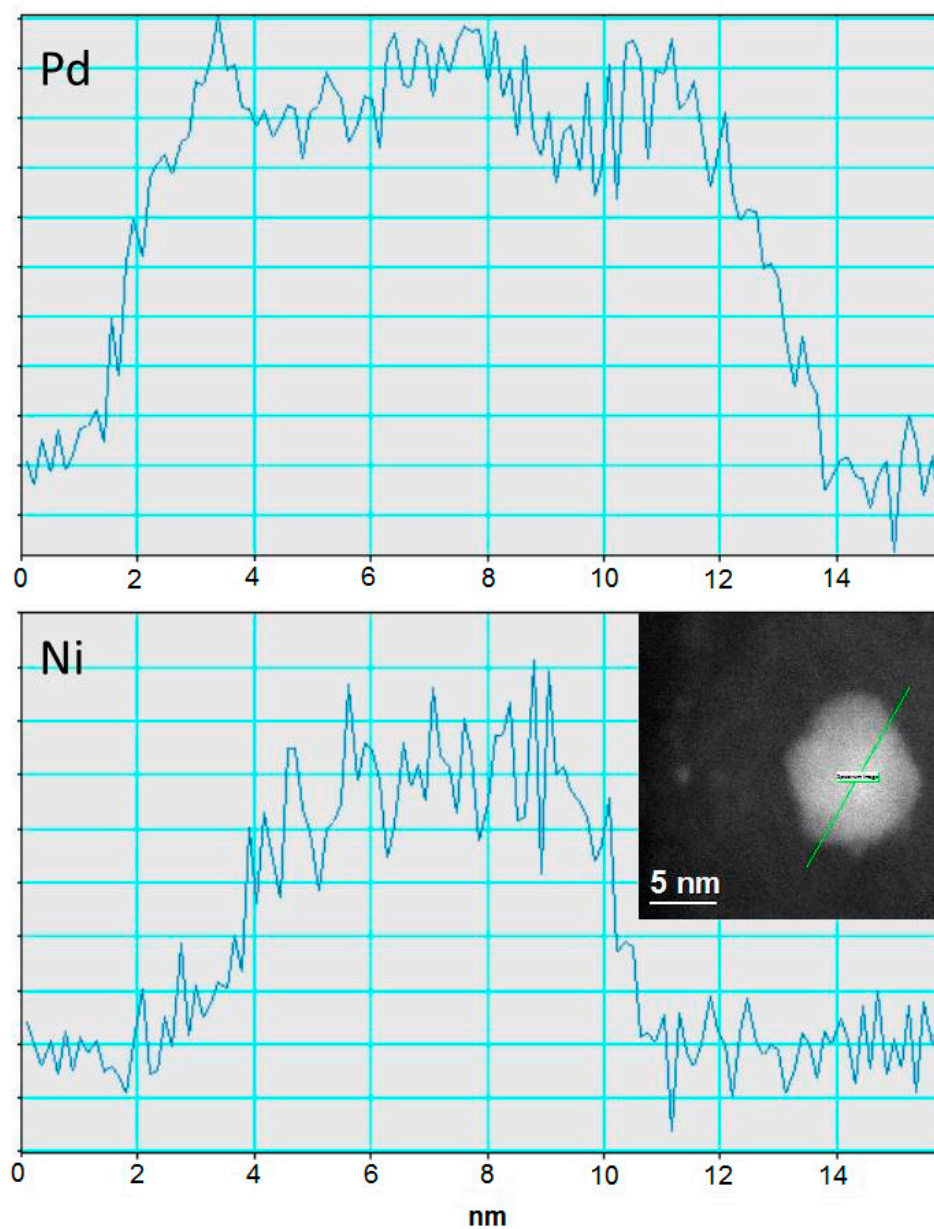
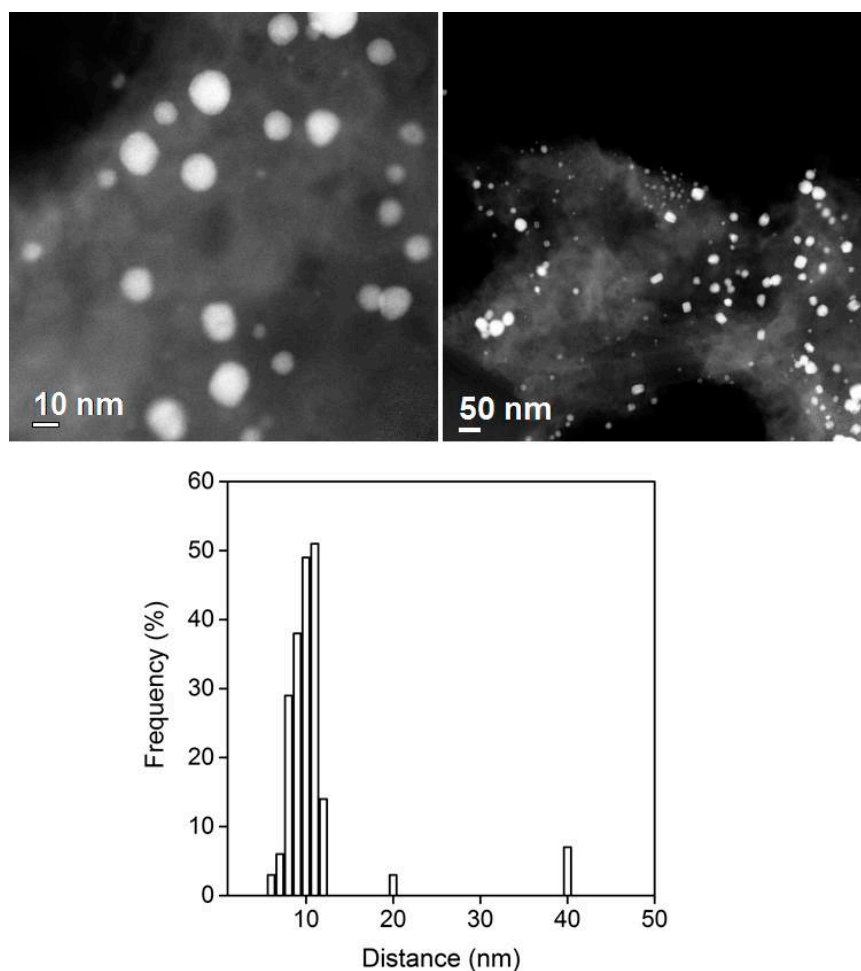


## Supplementary Information



**Figure S1.** EELS line scan profile for Pd M-edge and Ni L-edge from a single nanoparticle along the scanned line as indicated in the inset.



**Figure S2.** HAADF-STEM images of the PdNiN/C catalyst along with particle size distribution of the nanoparticles (sample size = 200).

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