Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Cyanide Bridged Coordination Polymer Nanoflakes Thermally Derived Ni_3C and fcc-Ni Nanoparticles for Electrocatalysts

Mohamed B. Zakaria,[1,2]* El-Zeiny M. Ebeid,[2] Mohamed M. Abdel-Galeil,[2] and Toyohiro Chikyow[1,3]*

1 International Research Center for Materials Nanoarchitechtonics (MANA), National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan.

2 Department of Chemistry, Faculty of Science, Tanta University, Tanta, Gharbeya 31527, Egypt.

3 Materials Data & Integrated System (MaDIS), National Institute for Materials Science (NIMS), 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, Japan.

E-mails: Chikyo.toyohiro@nims.go.jp

mohamed.barakat@nims.go.jp

mohamed.hegazy3@science.tanta.edu.eg

Figure S1

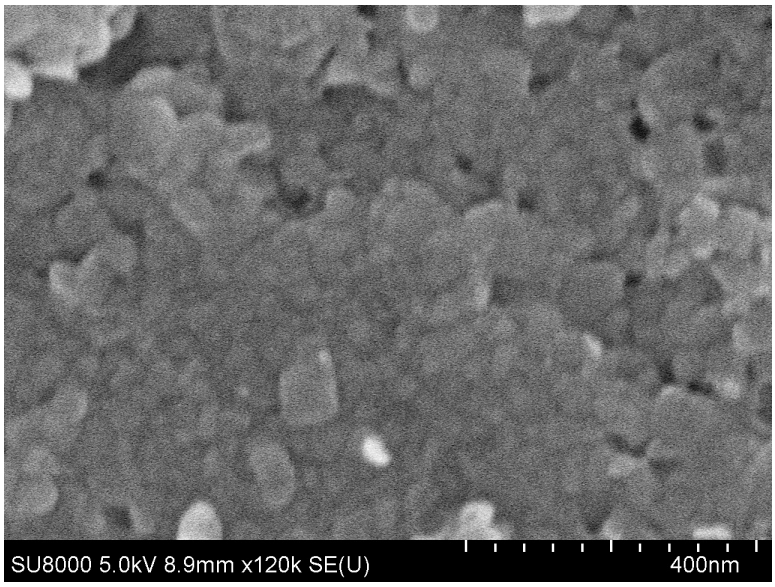

Figure S1 SEM of the as-prepared NiCNNi CP in absence of TSCD.

Figure S2

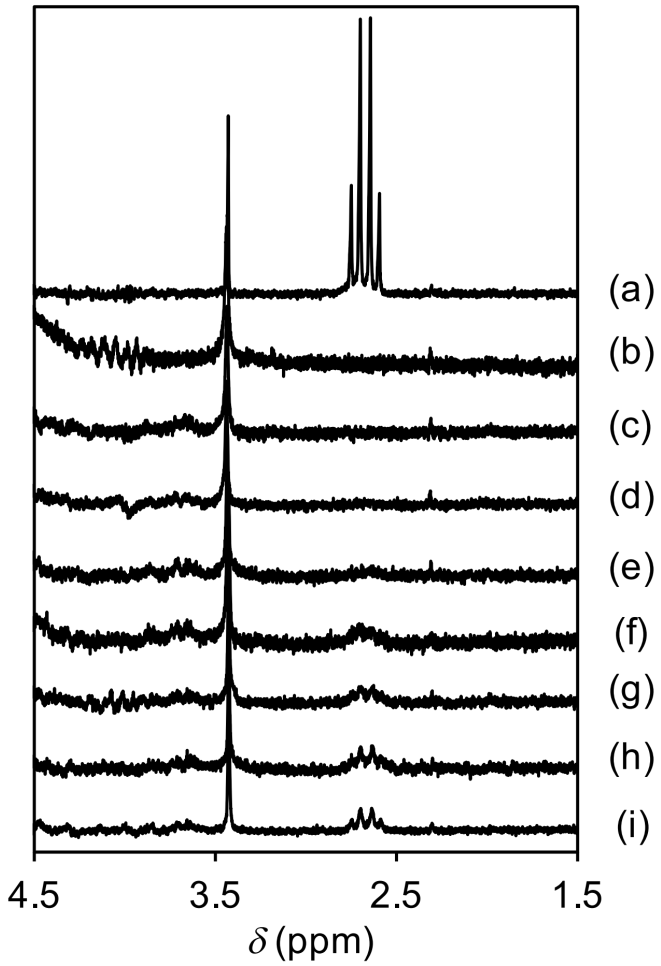

Figure S2 ^{1}H NMR spectra of TSCD in absence (a) and presence (b) of $NiCl_2.6H_2O$. Time course ^{1}H NMR spectra of Ni-TSCD complex measured after addition of $K_2[Ni(CN)_4].xH_2O$ at 10 min (c), 30 min (d), 1 h (e), 3 h (f), 6 h (g), 12 h (h), and 24 h (i).

Figure S3

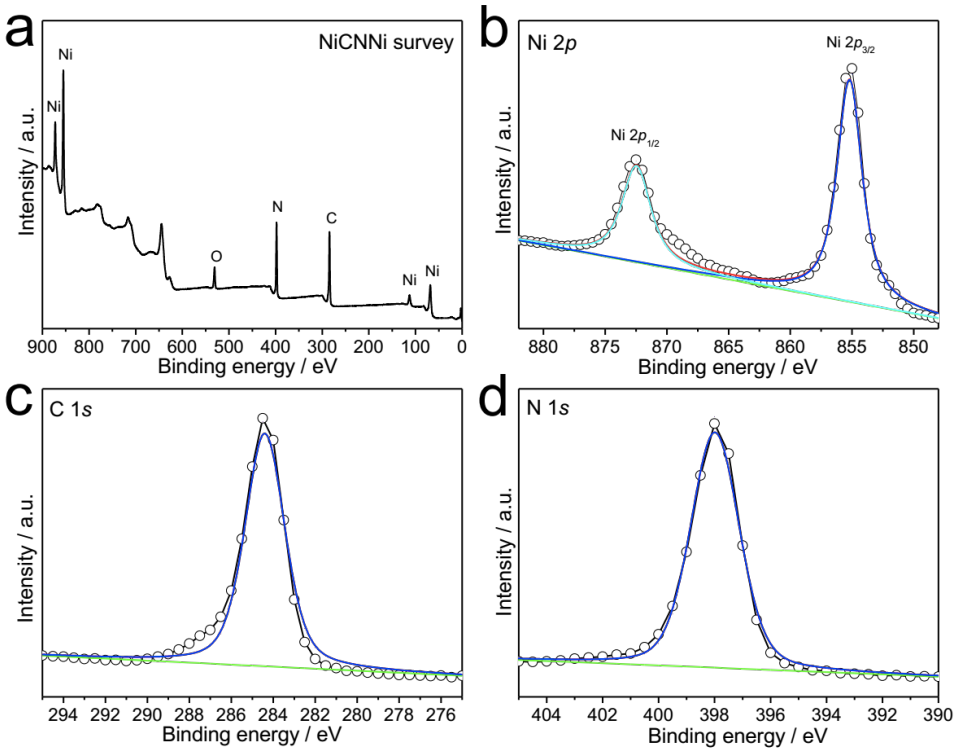

Figure S3 Wide-range XPS survey (a) and high resolution XPS spectra of Ni 2*p* (b), C 1*s* (c), and N 1*s* (d) of NiCNNi CP nanoflakes.

Figure S4

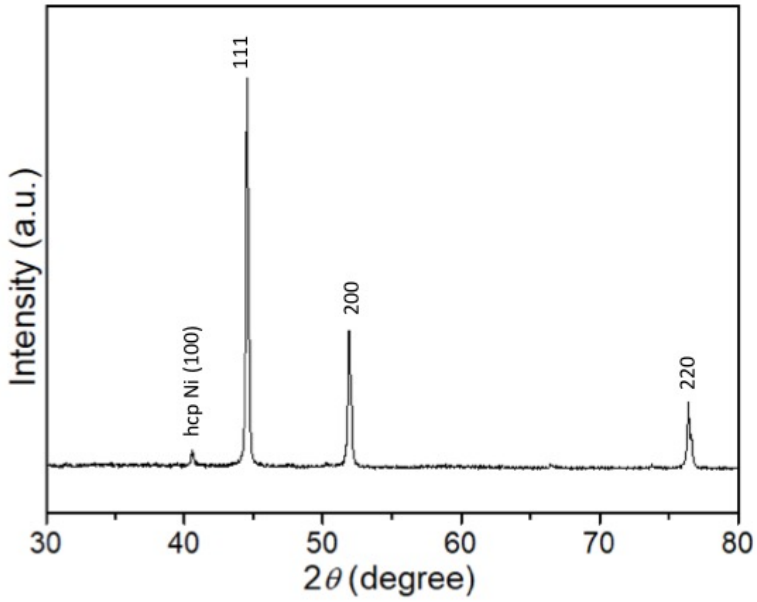

Figure S4 Wide-angle XRD patterns of fcc-Ni nanoparticles obtained at 650 °C.

Figure S5

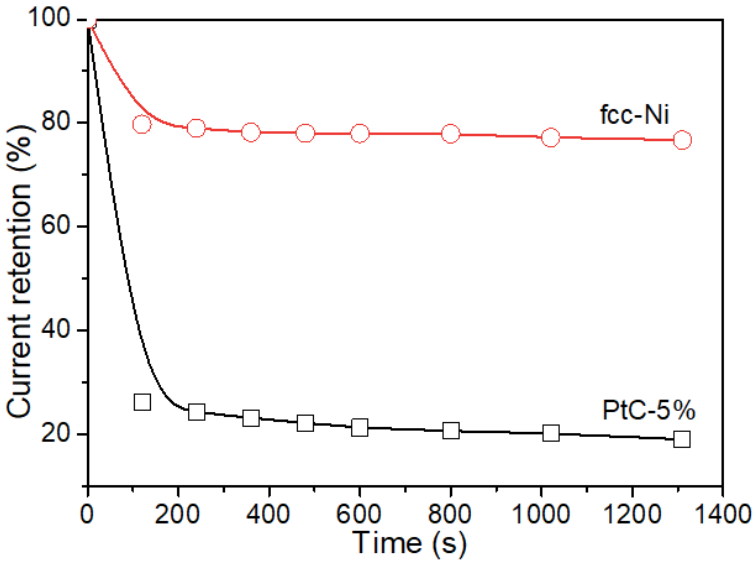

Figure S5 Current retention plot during chronoamperometric measurements at a constant potential (-0.5 V *vs.* Ag/AgCl) for thermally derived fcc-Ni and commercially available Pt/C-5% catalysts.