

Supporting Information

Electrocatalytic conversion of waste polyethylene furanoate(PEF) for the production of formic acid and hydrogen energy

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Figures

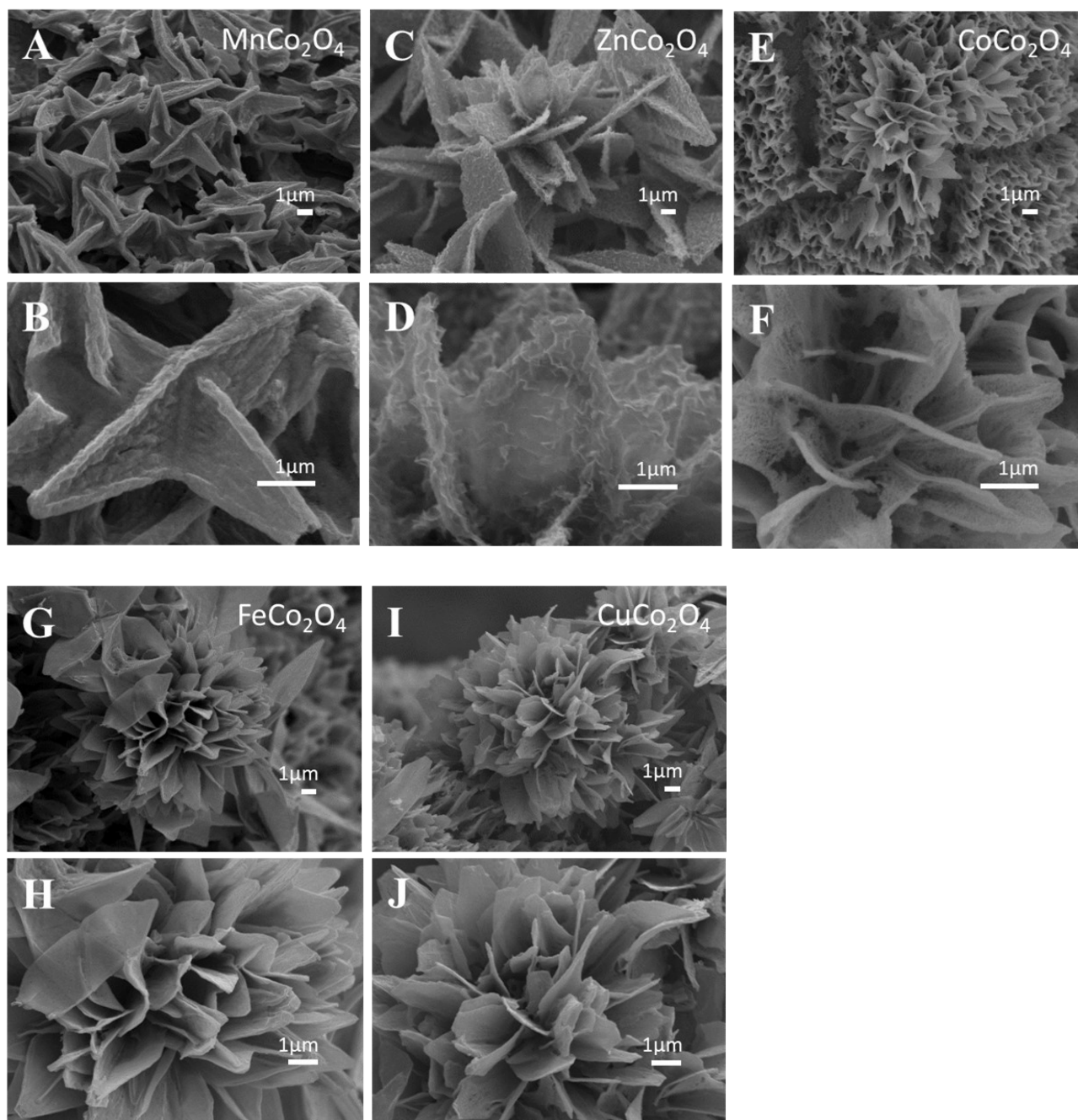


Figure. S1. Low- and high-magnification SEM images of the MnCo₂O₄, ZnCo₂O₄, CoCo₂O₄, FeCo₂O₄, and CuCo₂O₄ nanoflower or nanowire arrays directly grown on NF.

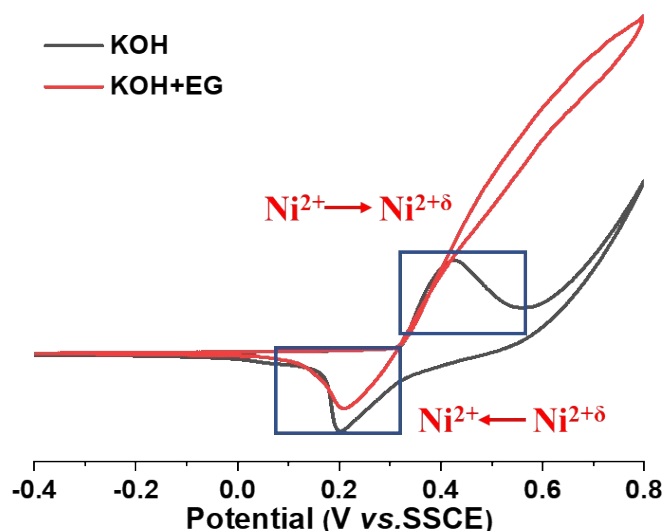


Figure. S2. Cyclic voltammetry curves in 1 M KOH solution with (red) and without (black) the presence of 0.1 M PEF hydrolysate for MCo_2O_4 .

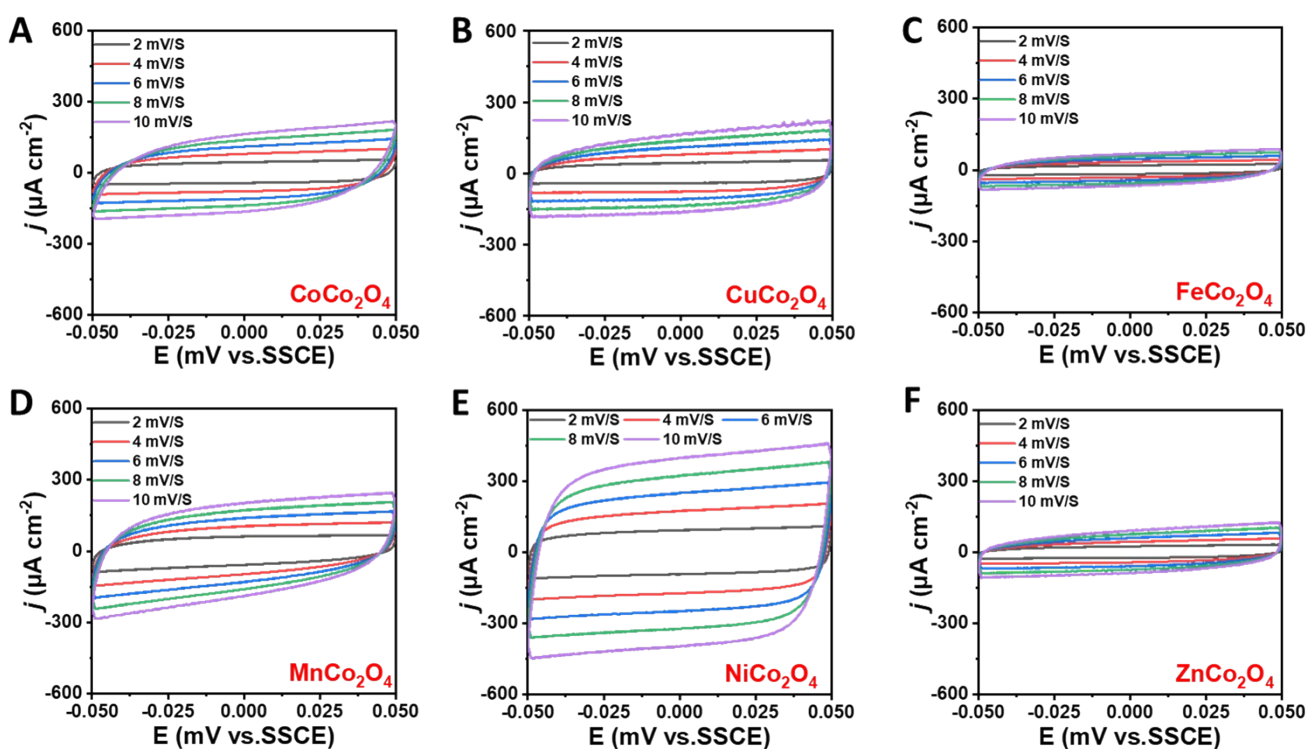


Figure. S3. Capacitive charging currents of MCo_2O_4 electrode, as indicated in the figures, in the non-Faradaic potential region between -0.05 V - 0.05 V vs. SSCE at scan rates from 2 to 10 mV/s at an interval of 5 mV in 1 M KOH.

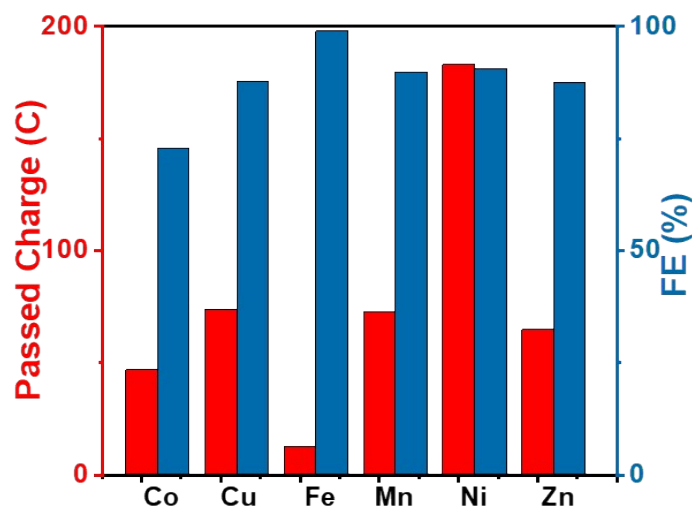


Figure. S4. EG conversion, Faradaic efficiency and formate yield of the electrolysis at 1.40 V using NiCo_2O_4 electrode in 1 M KOH solution with 0.1 M EG for 3h.

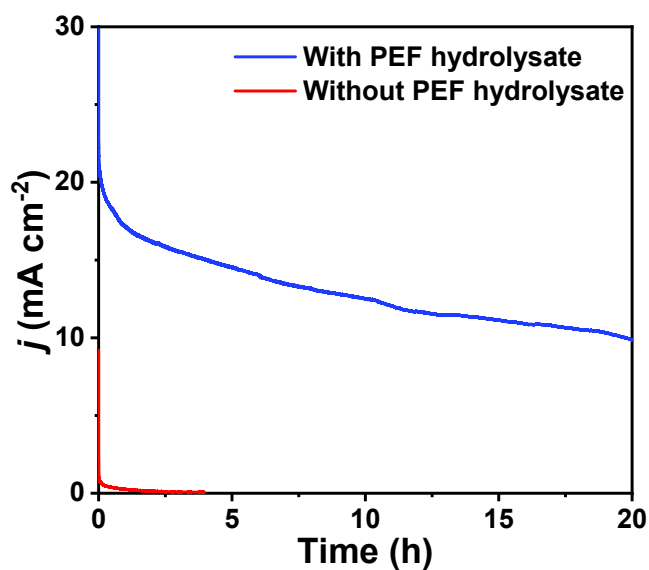


Figure. S5. Controlled-potential electrolysis at 1.40 V of NiCo_2O_4 electrode in 1 M KOH solution with and without 0.1 M PEF hydrolysate.

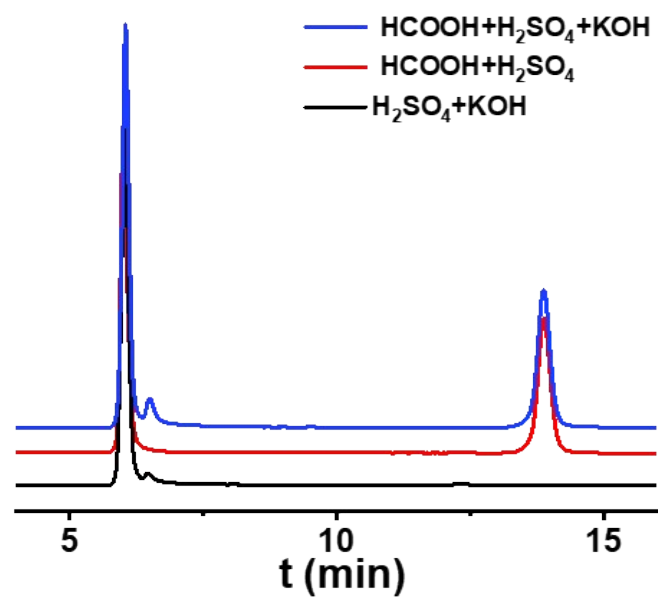


Figure. S6. HPLC spectrum of the mixed solution with concentration of KOH and H₂SO₄. The results data indicates that the peak at 6.0 and 6.5 min can be considered as background peak.

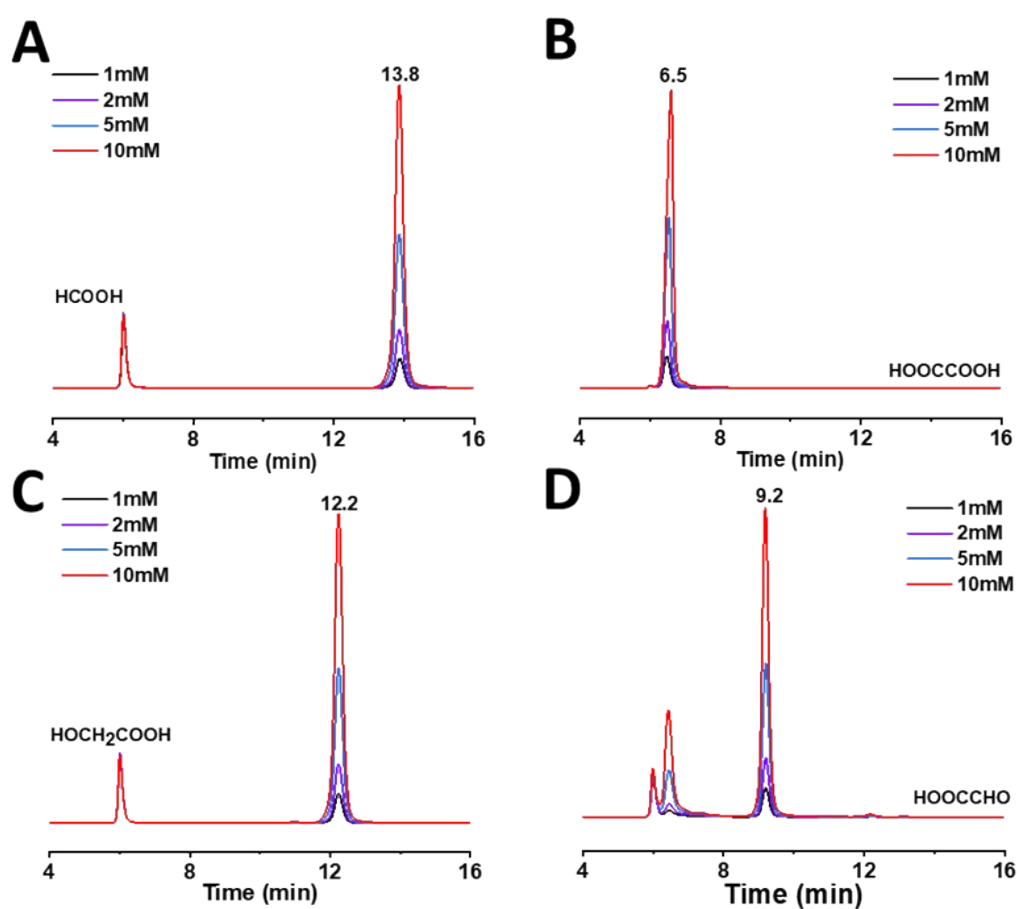


Figure. S7. Standard HPLC spectrum of various potential products derived from the EG oxidation, including (A) formic acid (B) oxalic acid (C) glycolic acid (D) glyoxylic acid.

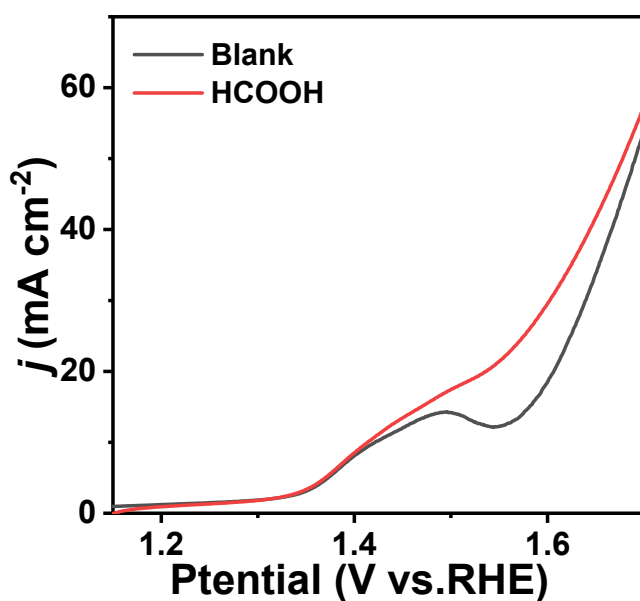


Figure. S8. LSV curves of NiCo₂O₄ in 1 M KOH solution with and without adding 0.1 M formic acid.

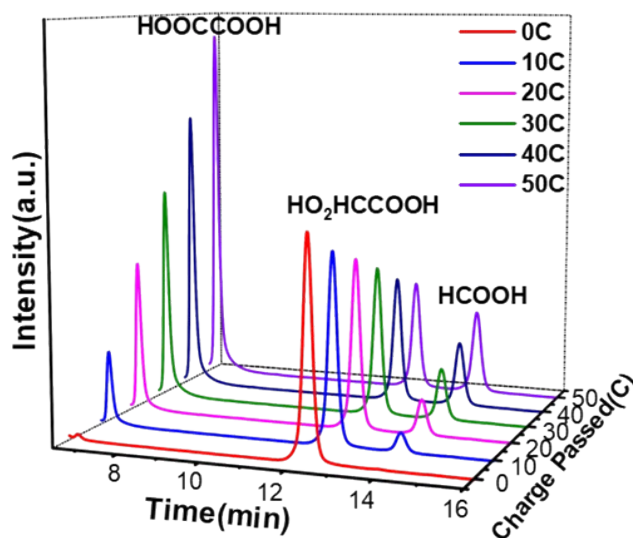


Figure. S9. HPLC spectrum of of the glycollic acid oxidation products at the constant potential of 1.40 V with different amounts of charge passed.