

Supporting Information

Electrooxidation of Urea in Alkaline Solution Using Nickel Hydroxide Activated Carbon Paper Electrodeposited from DMSO Solution

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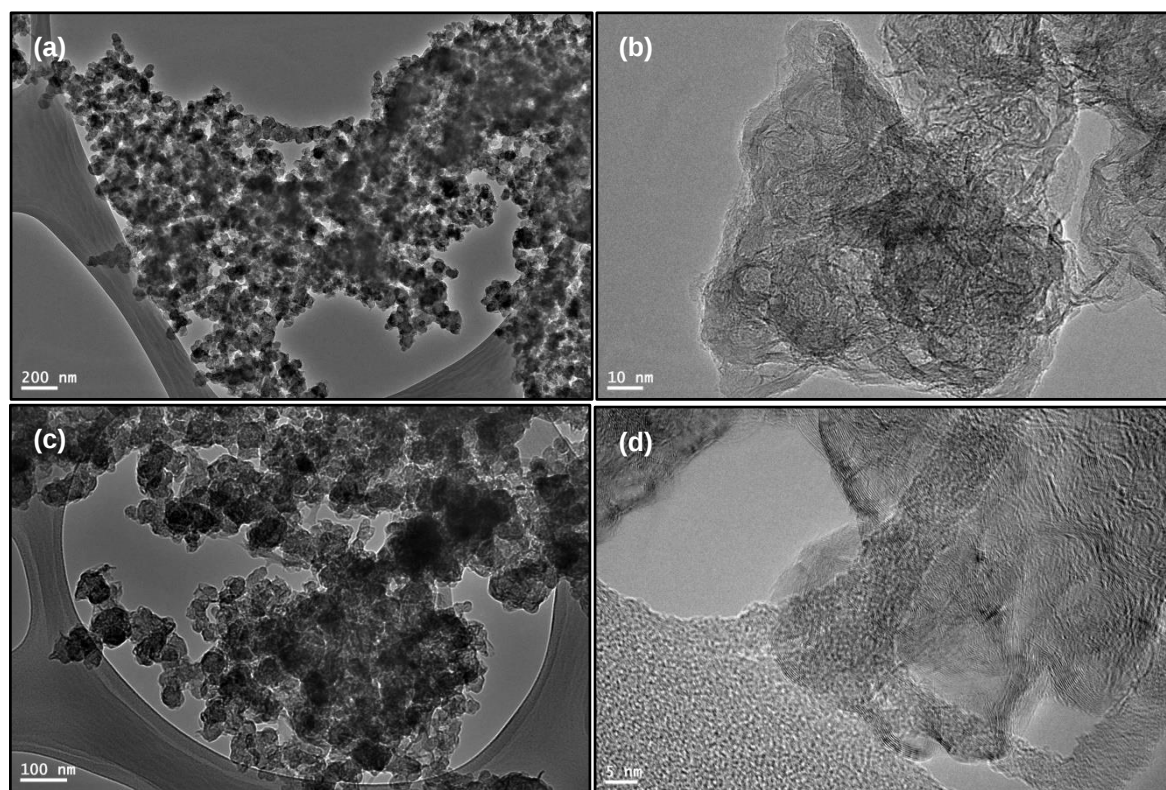


Figure S1. Morphological characterization of $\text{Ni(OH)}_2/\text{CP}$ based electrodes prepared with a different medium. HRTEM micrographs of $\text{Ni(OH)}_2\text{-DW/CP}$ (a,b) electrodes prepared under aqueous medium, $\text{Ni(OH)}_2\text{-DMSO/CP}$ (c,d) obtained through electrodeposition approach through DMSO solution.

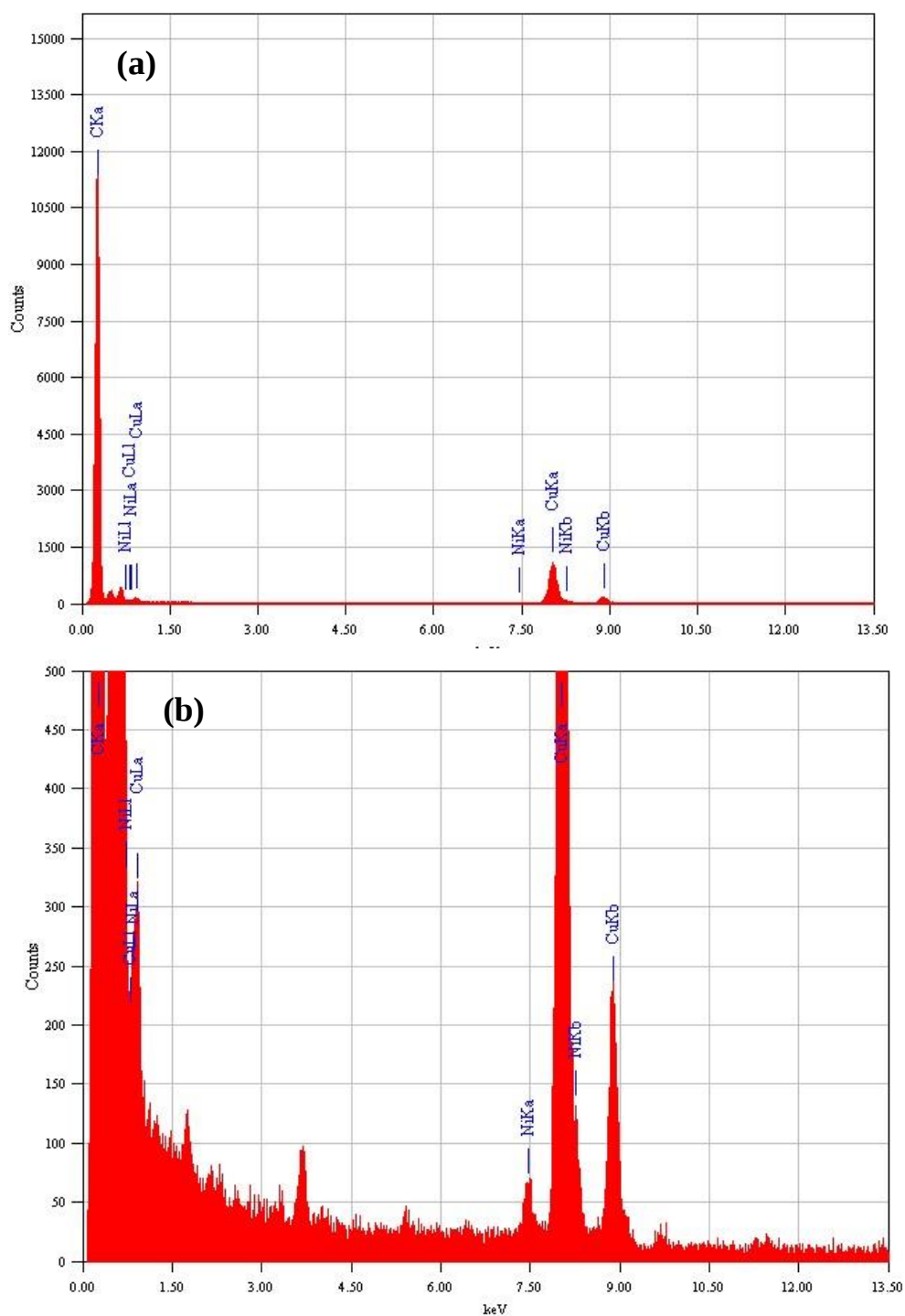


Figure S2. EDAX analysis of Ni(OH)₂-DW/CP (a) electrodes prepared under aqueous medium, Ni(OH)₂-DMSO/CP (b) obtained through electrodeposition approach through DMSO solution.

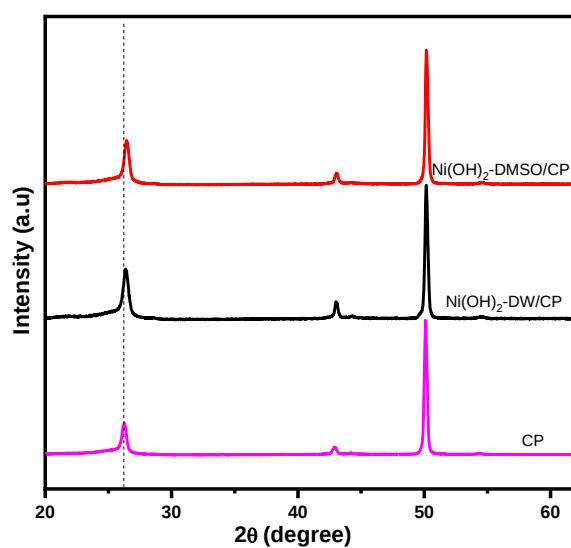


Figure S3. X-ray diffraction analysis of carbon paper (CP), Ni(OH)₂-DW/CP, and Ni(OH)₂-DMSO/CP obtained through electrodeposition method.

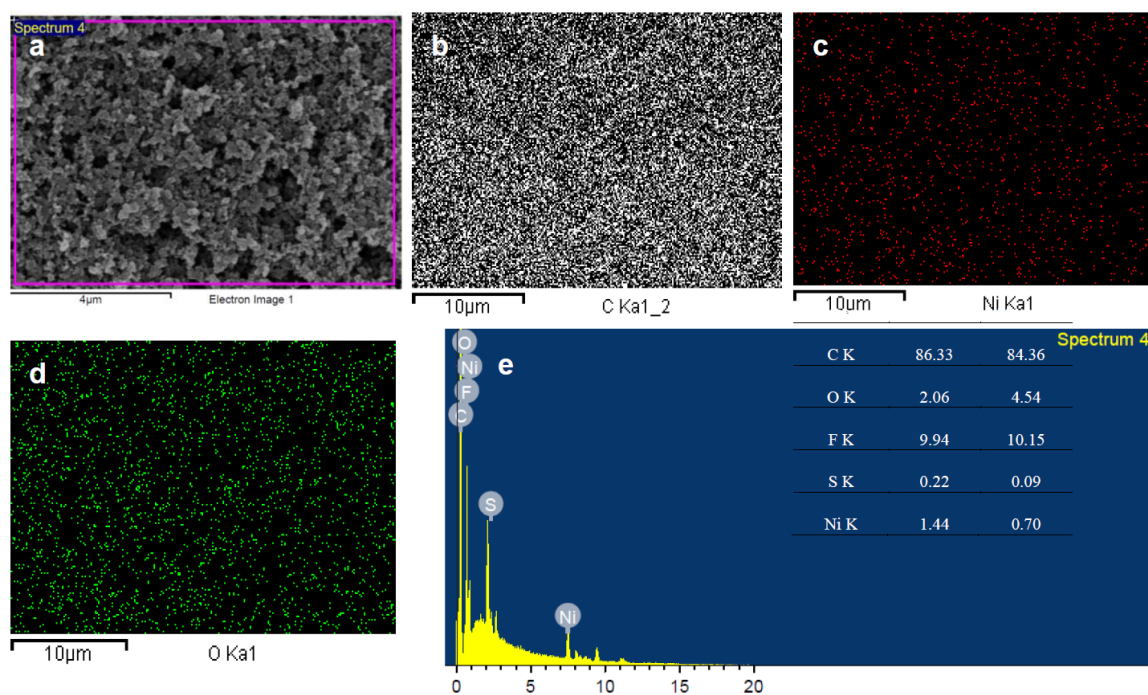


Figure S4. SEM and the EDX profile of C, Ni, and O elements of Ni(OH)₂-DMSO/CP (C) electrodes prepared with DMSO medium (a–e).

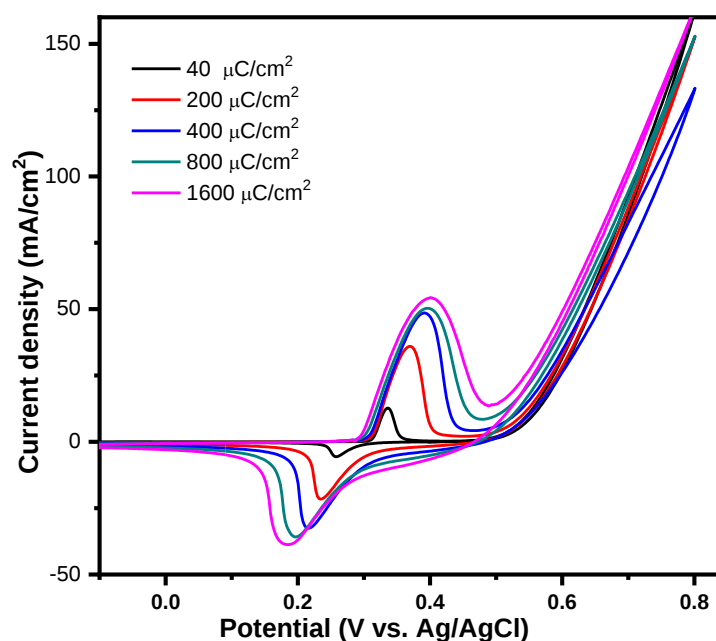


Figure S5. Cyclic voltammograms for Ni(OH)_2 catalysts deposited from different deposition charge from DMSO and at scan rate 50mVs^{-1} in the presence of 1.0M KOH .

Table S1. XPS analysis of $\text{Ni(OH)}_2/\text{CP}$ electrodes obtained from various solutions: DMSO and H_2O .

Sample	At%		
	carbon	oxygen	nickel
$\text{Ni(OH)}_2\text{-DMSO/CP}$	70.7	27.9	1.4
$\text{Ni(OH)}_2\text{-DW/CP}$	40.4	53.6	6.0

Table S2. EIS parameters involving R_s , R_{ct1} , R_{ct2} , CPE_1 and CPE_2 elements for Ni(OH)_2 catalysts deposited from DMSO and H_2O solutions at various potentials in 0.33M urea/KOH .

E, V	R_s , ohm	R_{ct1} , ohm	CPE_1	R_{ct2} , ohm	CPE_2	X^2
0.35	10.3	3.80	0.0196	14.90	0.0116	0.03523
0.40	10.2	4.70	0.0216	0.878	0.0576	0.02805
0.45	10.3	0.825	4.940	3.490	0.0183	0.02835
0.50	10.3	1.05	2.650	2.680	0.0188	0.02876
0.55	10.3	2.27	0.0186	1.100	1.9300	0.02860
0.60 $\text{Ni(OH)}_2\text{-DMSO/CP}$	10.3	2.12	0.0177	1.160	1.4800	0.02861
0.60 $\text{Ni(OH)}_2\text{-DW/CP}$	9.48	1.66	1.450	6.100	0.0219	0.03596