

Supplementary Information

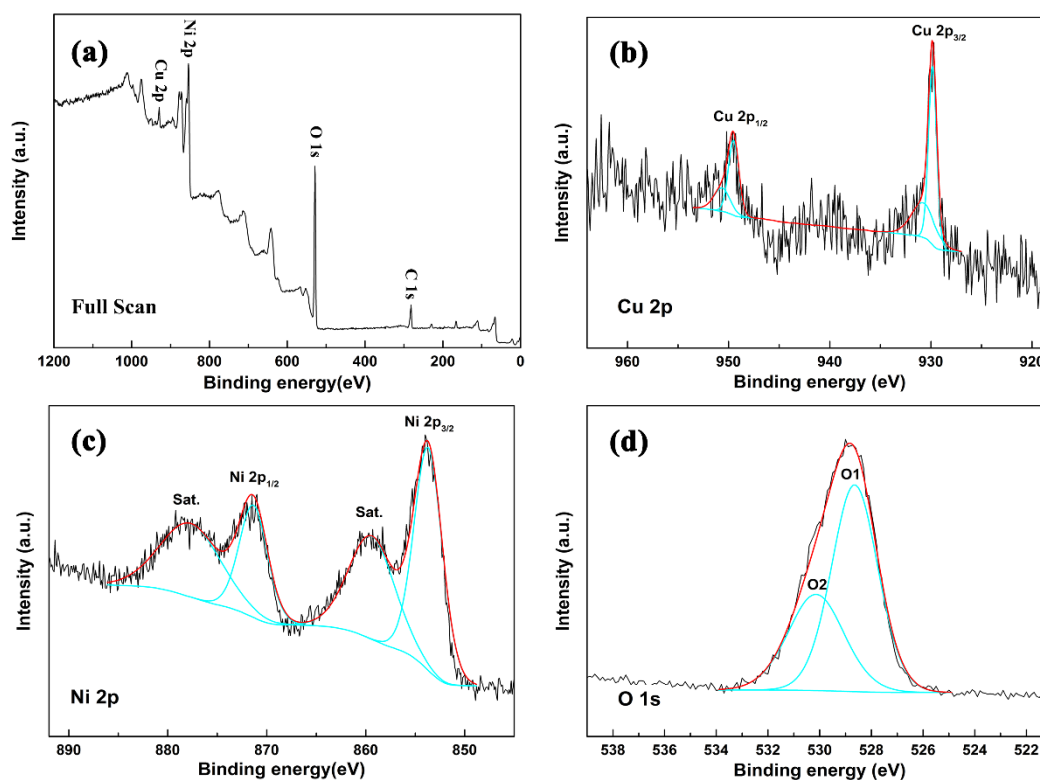


Fig. S1 XPS spectra of (a) Full scan, (b) Cu 2p, (c) Ni 2p, and d) O 1s for the Ni(OH)₂-Cu nanosheets on Ni foam.

XPS measurements were carried out to obtain more information about elemental composition and valences about the hybrid film. The corresponding results are presented in Fig. S1 (a-d). Fig. S1 (a) displays the full scan spectra of Ni(OH)₂-Cu, from which four elements can be resolved: Cu 2p, Ni 2p, O 1s and C 1s. The peaks in Fig. S1 (b) at 929.9 and 949.6 eV are associated with Cu 2p_{3/2} and Cu 2p_{1/2}, respectively. In Ni 2p XPS spectrum (Fig. S1 (c)), two spin-orbit doublets at 871.7 eV and 853.8 eV, defined as Ni 2p_{1/2} and Ni 2p_{3/2} respectively, together with two shakeup satellites close to them are typical Ni²⁺ signal.¹ Fig. S1 (d) exhibits XPS spectrum of O 1s, with two oxygen contributions denoted as O1 and O2, respectively. Specifically, the component O1 at 528.6 eV is typical metal-oxygen bonds, which can be associated with nickel-oxygen bonds. The component O₂ at 528.6 eV is associated with water in the hybrid's molecule and also physically absorbed water from air.² The atomic ratio of Ni to Cu element is 11.58 : 0.68 ≈ 17.03, which is calculated based on the ratio of peak areas of these two elements. The corresponding weight ratio of Ni(OH)₂ (Ni(OH)₂!0.75H₂O) to Cu is calculated to be 28.46.

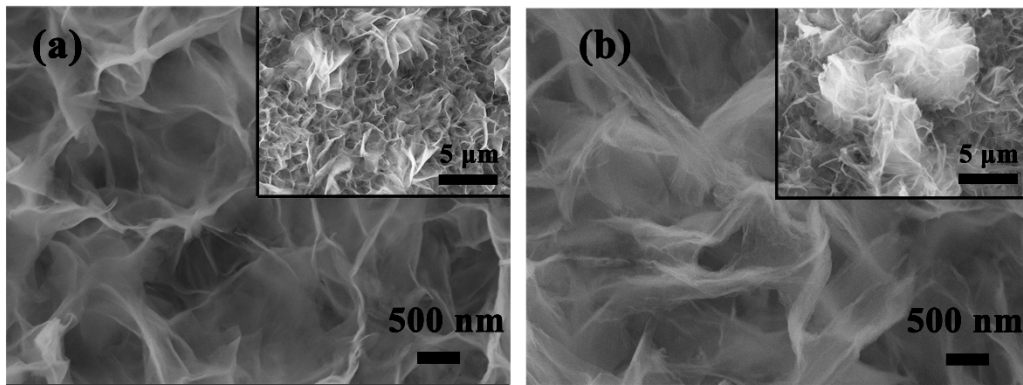


Fig. S2 SEM images of (a) Ni(OH)₂-Cu nanosheets on (The inset shows a low magnification scale); (b) Ni(OH)₂ nanosheets (The inset shows a low magnification scale).

References

1. H. Chen, L. Hu, M. Chen, Y. Yan and L. Wu, *Advanced Functional Materials*, 2014, **24**, 934-942.
2. C. Yuan, J. Li, L. Hou, X. Zhang, L. Shen and X. W. D. Lou, *Advanced Functional Materials*, 2012, **22**, 4592-4597.