Supporting Information

Size-controlled Ag Quantum Dots Decorated on Binder-free Hierarchical NiCoP Films by Magnetron Sputtering to Boost Electrochemical Performance for Supercapacitors

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The SEM images of NiCoP on nickel foam are illustrated in Fig. S1. Its morphology exhibits a nanosheet-assembled hierarchical architecture. Open spaces among nanosheets increase the specific surface areas.

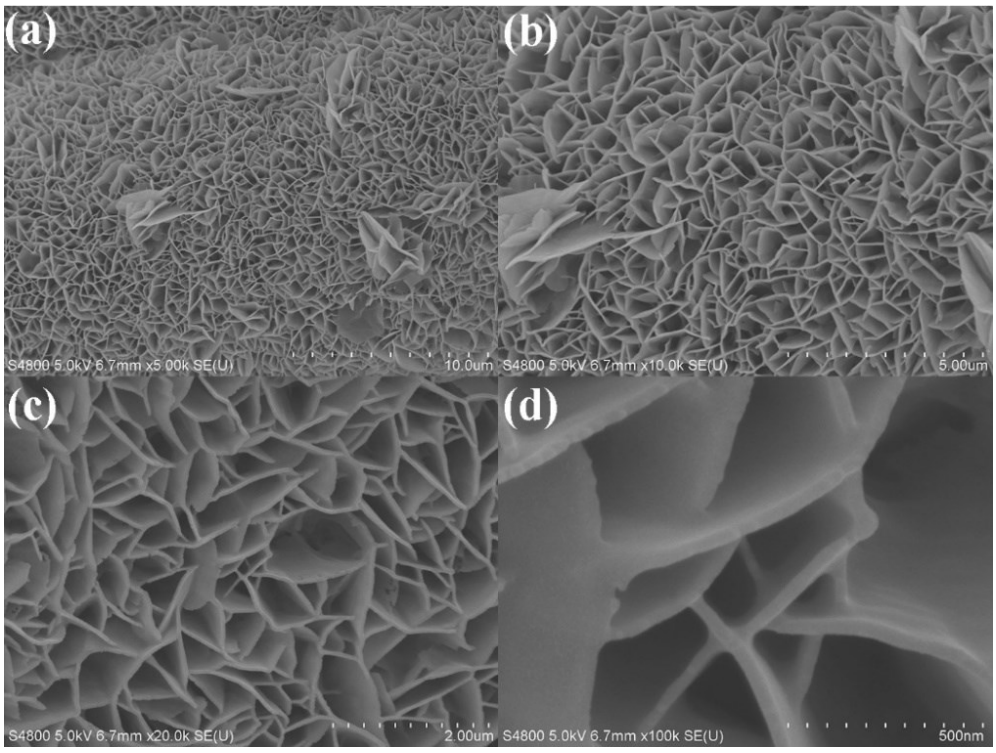

Figure S1. SEM images of NiCoP on nickel foam at different resolutions

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The morphology of nickel-cobalt hydroxide layers (NiCo-LDHs) shown in Fig. S2 maintains the hierarchical structures which are composed of interconnecting nanosheets, exhibiting rough and porous surface.

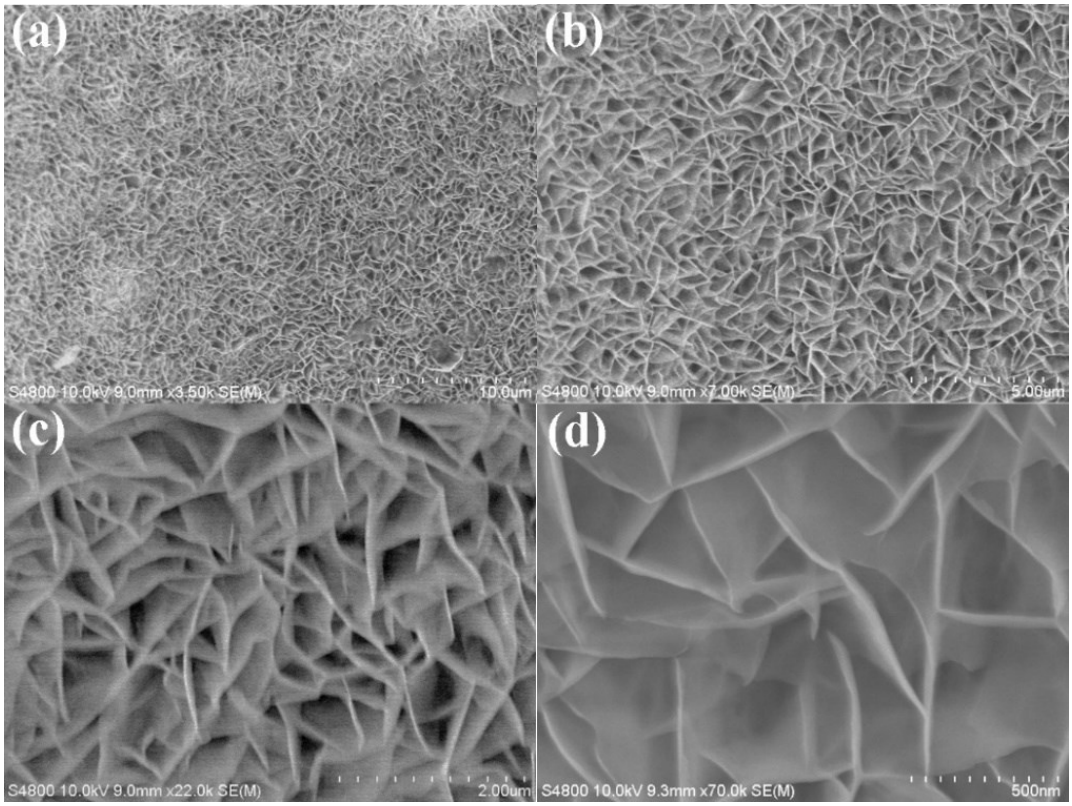

Figure S2. SEM images of NiCo-LDHs on nickel foam at different magnifications

It is observed that some tiny voids are generated over the NiCoP surface after the deposition of Ag quantum dots by magnetron sputtering. The distinct voids marked with white circles are obviously observed in Fig. S3

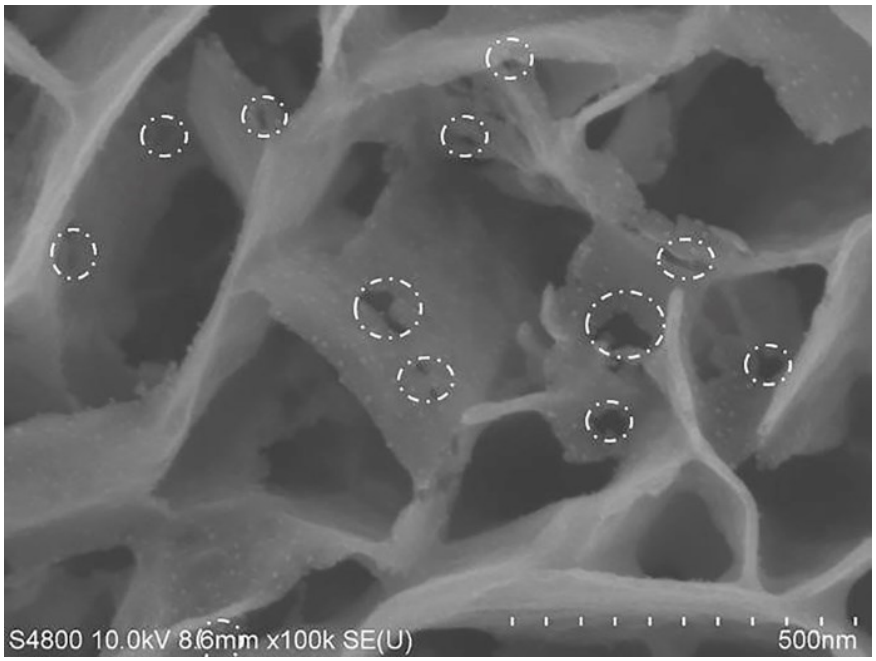

Figure S3 SEM images of Ag/NiCoP on nickel foam

The crystalline phase is investigated by powder XRD. The characteristic diffraction peaks suggest that pure NiCo-LDHs with high crystallinity are formed on nickel foam substrate.

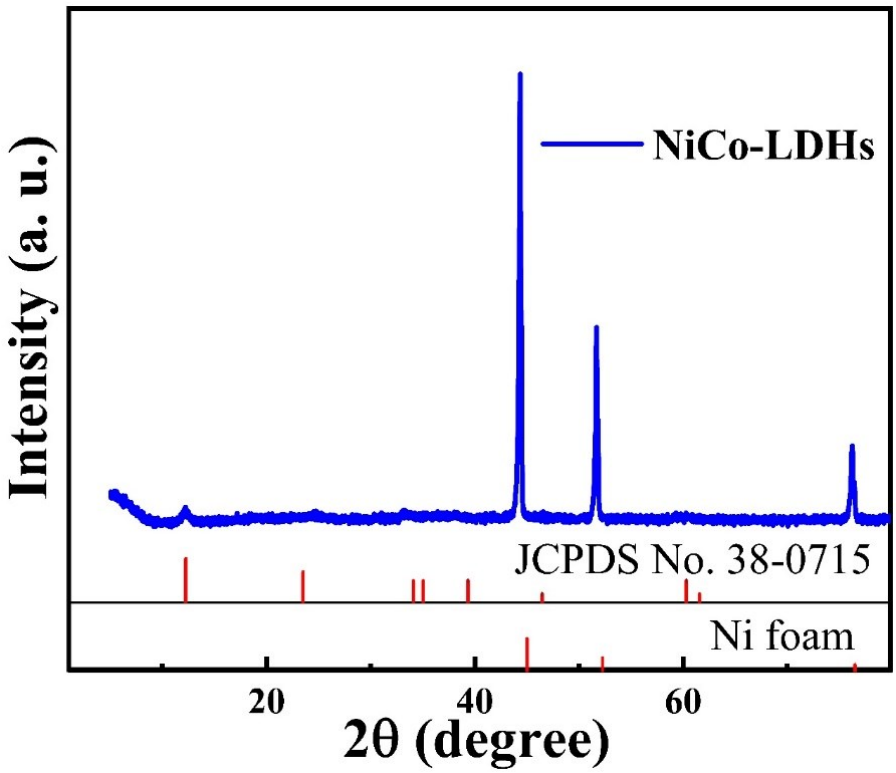

Figure S4 Powder XRD pattern of NiCo-LDHs

CV curve of bare nickel foam was measured at a scan rate of 5 mV/s in 6 M KOH. As shown in Fig. S5, the CV area and peak current of nickel foam are negligible in contrast to those of Ag/NiCoP.

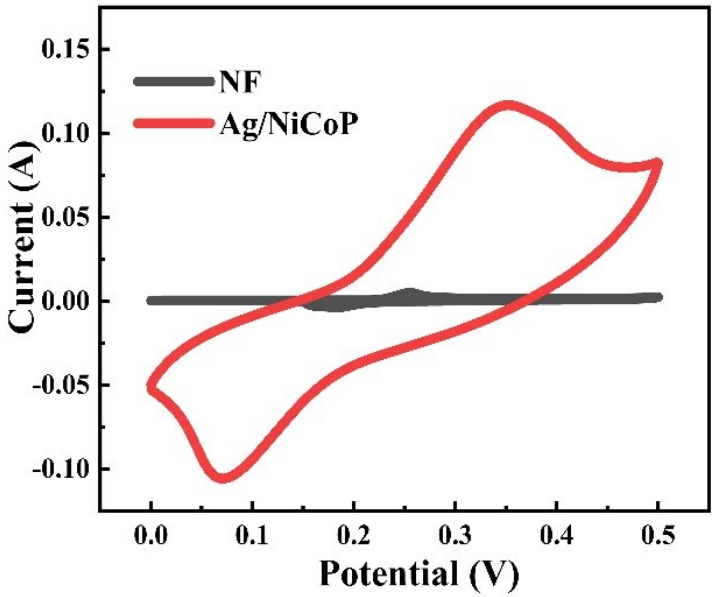

Figure S5 CV curves of Ag/NiCoP and nickel foam at 5 mV/s in 6 M KOH

CV curves of Ag QDs on the substrate nickel foam (Ag/NF) and nickel foam (NF) are tested at 5 mV/s in 6 M KOH and shown in Fig. S6.

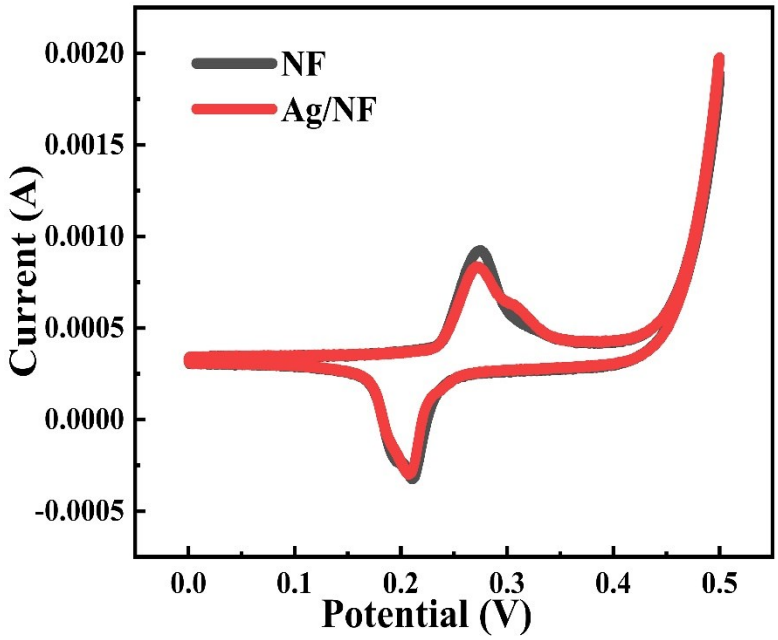

Figure S6 CV curves of Ag/NF and nickel foam at 5 mV/s in 6 M KOH

The influence of the Ag content on the electrochemical performance of NiCoP is studied. The CV curves of Ag/NiCoP with different sputtering time ranging from 0.5 to 5 s are shown in Fig. S7.

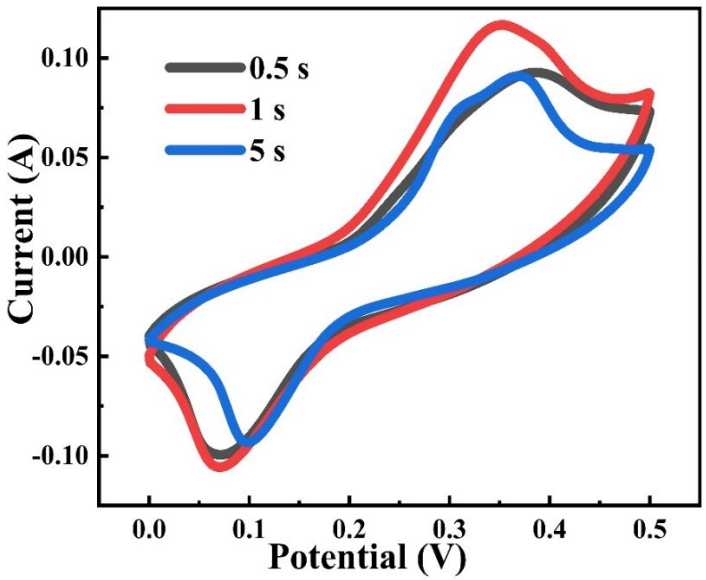

Figure S7 CV curves of Ag/NiCoP with different sputtering time

Figure S8 displays the CV results of AC electrode at different scan rates under the potential ranging from -1.0 to 0 V. The curves exhibit an approximately rectangular shape, indicating electrical double layer capacitor behavior.

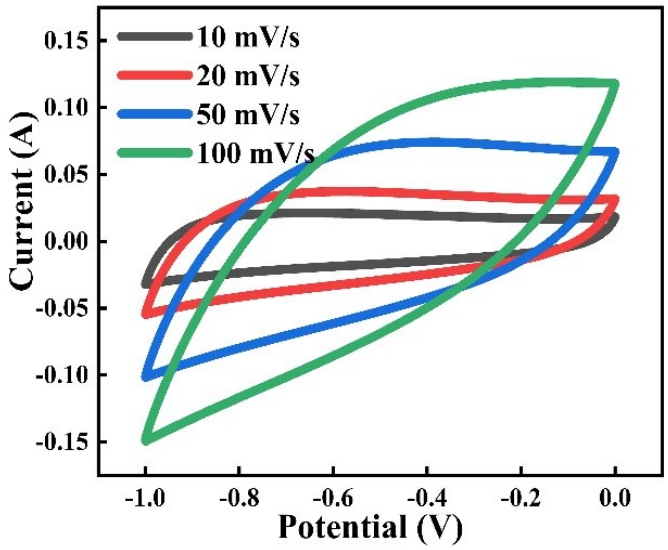

Figure S8 CV curves AC electrode at different scan rates.