

# Improving the Composite-structured Supercapacitor assembled with Ni-Co-layered Double Hydroxide and Polymer cement Electrolyte through Structural Optimization

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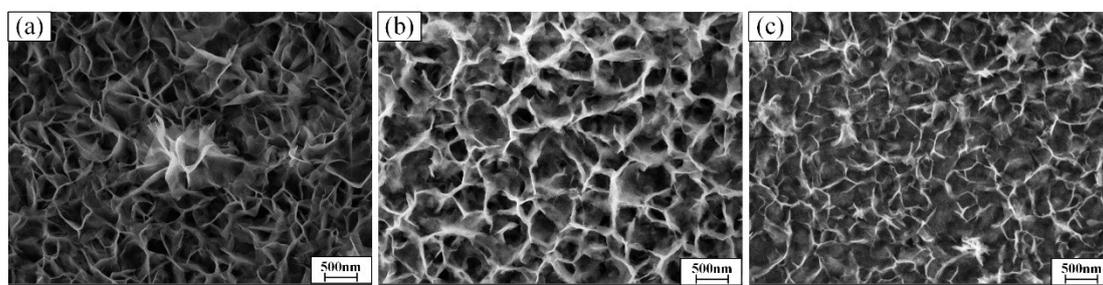


Fig.S1 SEM images of Ni<sub>3</sub>Co<sub>6</sub>-25 (a), Ni<sub>5</sub>Co<sub>6</sub>-25 (b), Ni<sub>7</sub>Co<sub>6</sub>-25(c).

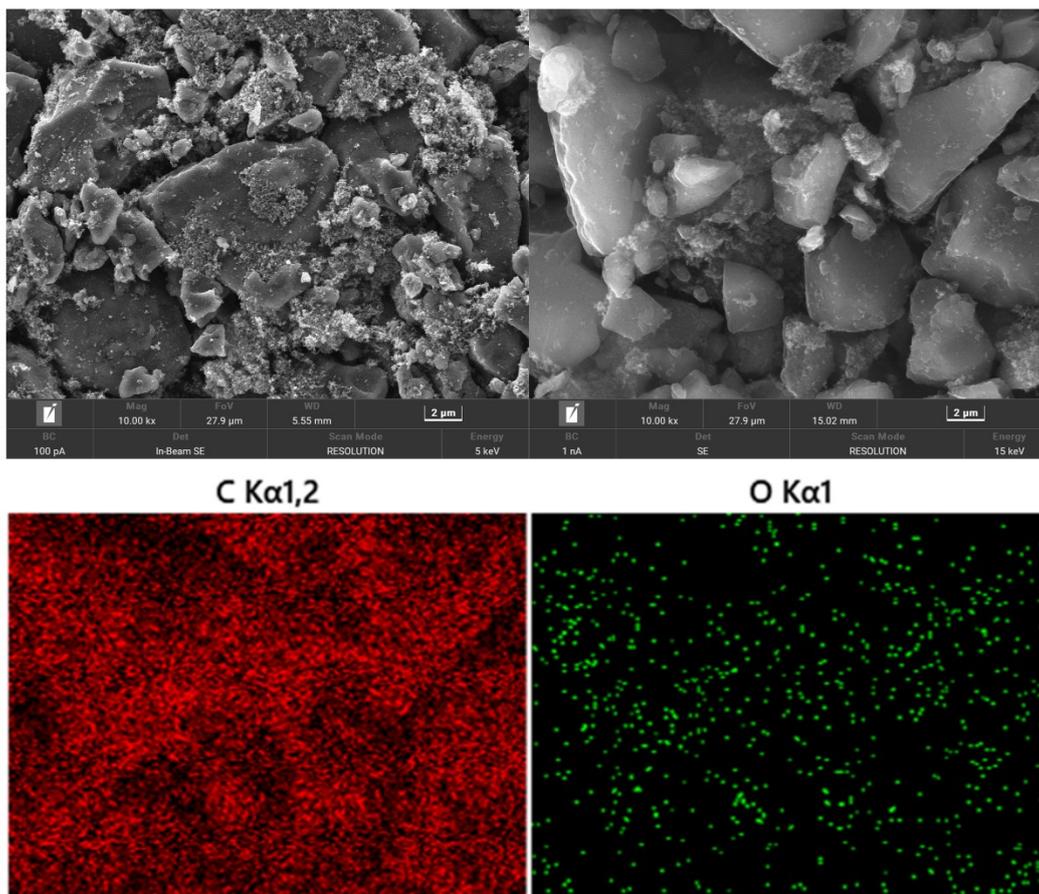


Fig.S2 SEM and mapping images of AC.

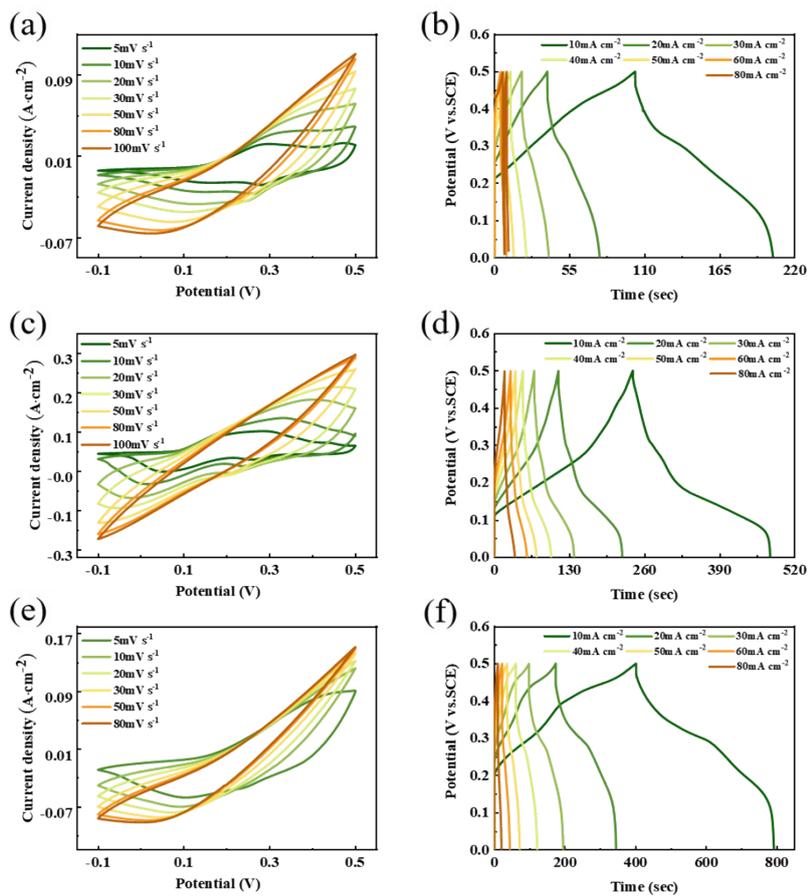


Fig. S3 (a) CV curves of  $\text{Ni}_0\text{Co}_{10}\text{-25}$  at different scan rates, (b) GCD curves of  $\text{Ni}_0\text{Co}_{10}\text{-25}$  at different current densities, (c) CV curves of  $\text{Ni}_3\text{Co}_6\text{-25}$  at different scan rates, (d) GCD curves of  $\text{Ni}_3\text{Co}_6\text{-25}$  at different current densities, (e) CV curves of  $\text{Ni}_4\text{Co}_6\text{-25}$  at different scan rates, (f) GCD curves of  $\text{Ni}_4\text{Co}_6\text{-25}$  at different current densities.

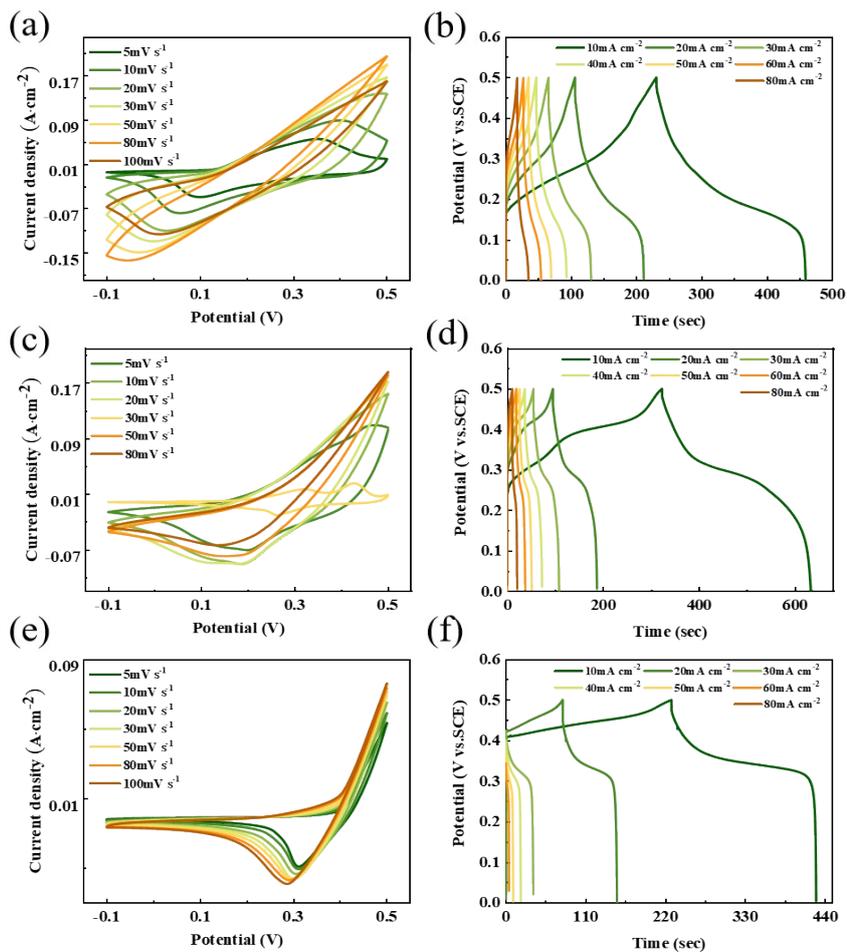


Fig. S4 (a) CV curves of Ni<sub>6</sub>Co<sub>6</sub>-25 at different scan rates, (b) GCD curves of Ni<sub>6</sub>Co<sub>6</sub>-25 at different current densities, (c) CV curves of Ni<sub>7</sub>Co<sub>6</sub>-25 at different scan rates, (d) GCD curves of Ni<sub>7</sub>Co<sub>6</sub>-25 at different current densities, (e) CV curves of Ni<sub>10</sub>Co<sub>0</sub>-25 at different scan rates, (f) GCD curves of Ni<sub>10</sub>Co<sub>0</sub>-25 at different current densities.

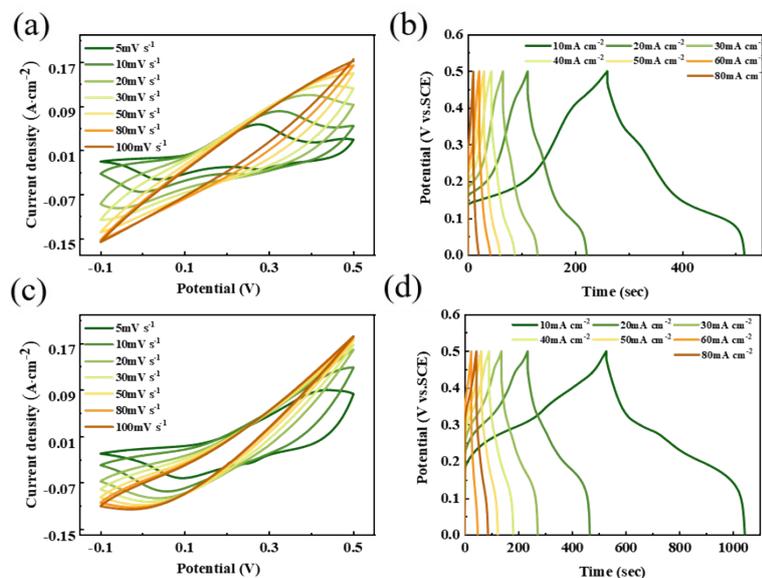


Fig. S5 (a) CV curves of Ni<sub>0</sub>Co<sub>10</sub>-10 at different scan rates, (b) GCD curves of Ni<sub>0</sub>Co<sub>10</sub>-10 at different current densities, (c) CV curves of Ni<sub>5</sub>Co<sub>6</sub>-5 at different scan rates, (d) GCD curves of Ni<sub>5</sub>Co<sub>6</sub>-5 at different current densities.

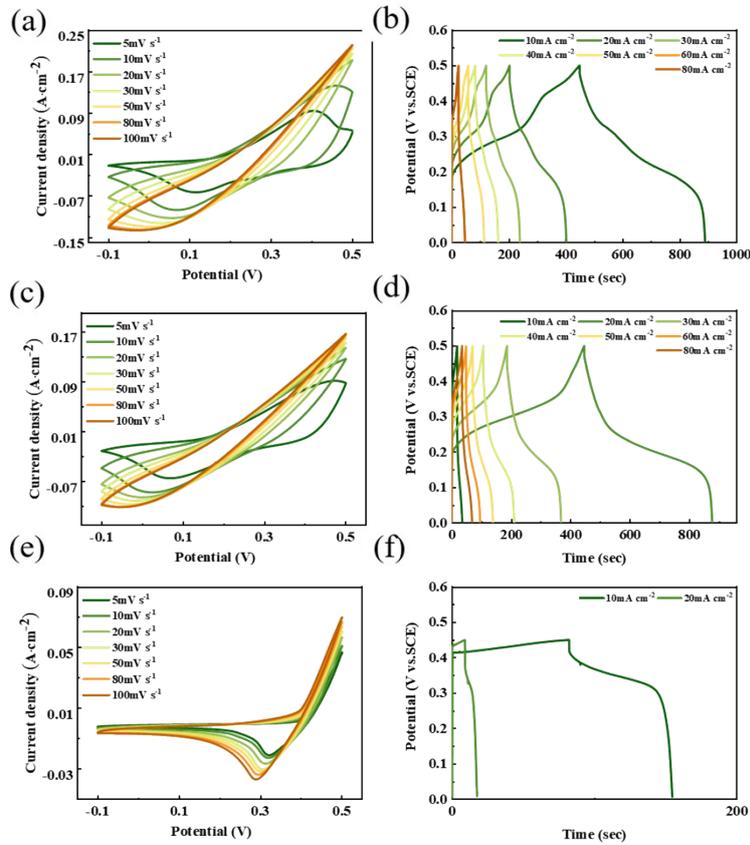


Fig. S6 (a) CV curves of Ni<sub>5</sub>Co<sub>6</sub>-15 at different scan rates, (b) GCD curves of Ni<sub>5</sub>Co<sub>6</sub>-15 at different current densities, (c) CV curves of Ni<sub>5</sub>Co<sub>6</sub>-20 at different scan rates, (d) GCD curves of Ni<sub>5</sub>Co<sub>6</sub>-20 at different current densities, (e) CV curves of Ni<sub>10</sub>Co<sub>0</sub>-10 at different scan rates, (f) GCD curves of Ni<sub>10</sub>Co<sub>0</sub>-10 at different current densities.

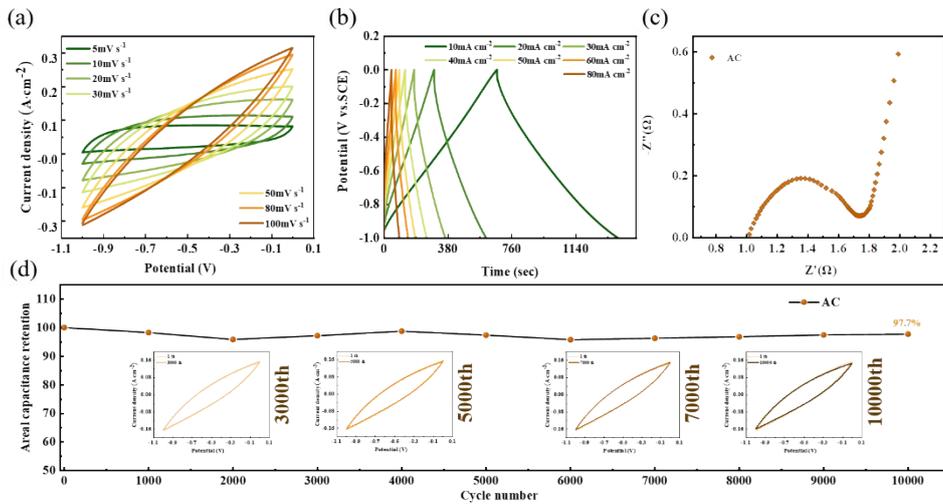


Fig. S7 (a) CV curves of AC at different scan rates, (b) GCD curves of AC at different current densities, (c) EIS curve for AC, (d) cycling performance.

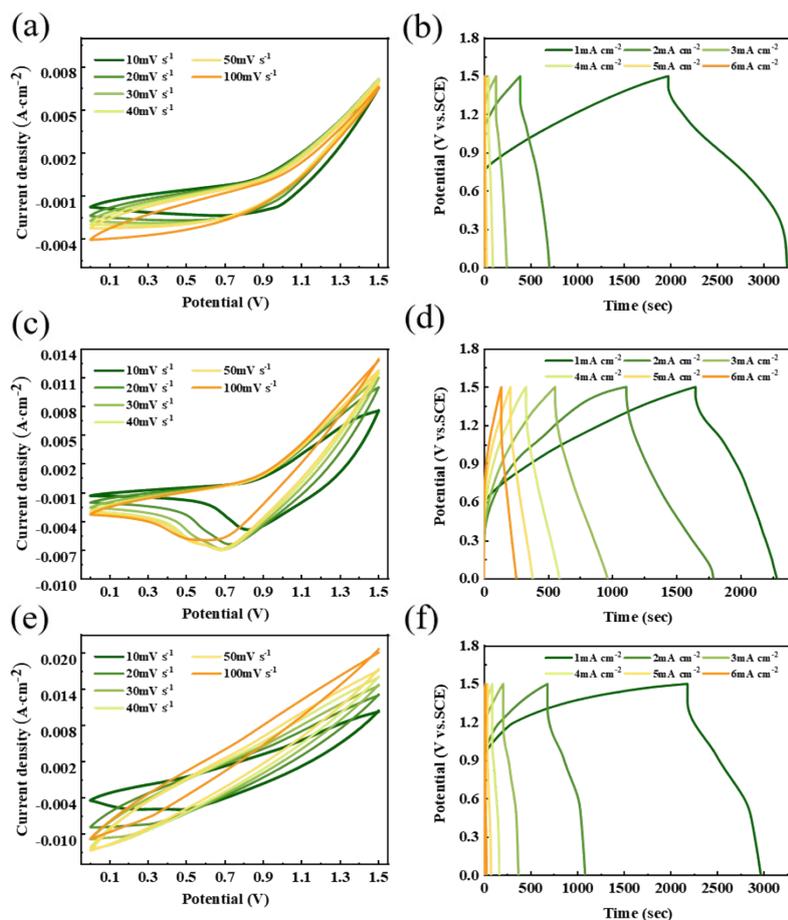


Fig. S8 (a) CV curves of SSC-Ni<sub>5</sub>Co<sub>6</sub>-25 at different scan rates, (b) GCD curves of SSC-Ni<sub>5</sub>Co<sub>6</sub>-25 at different current densities, (c) CV curves of SSC-Ni<sub>10</sub>Co<sub>0</sub>-10 at different scan rates, (d) GCD curves of SSC-Ni<sub>10</sub>Co<sub>0</sub>-10 at different current densities, (e) CV curves of SSC-Ni<sub>0</sub>Co<sub>10</sub>-10 at different scan rates, (f) GCD curves of SSC-Ni<sub>0</sub>Co<sub>10</sub>-10 at different current densities.

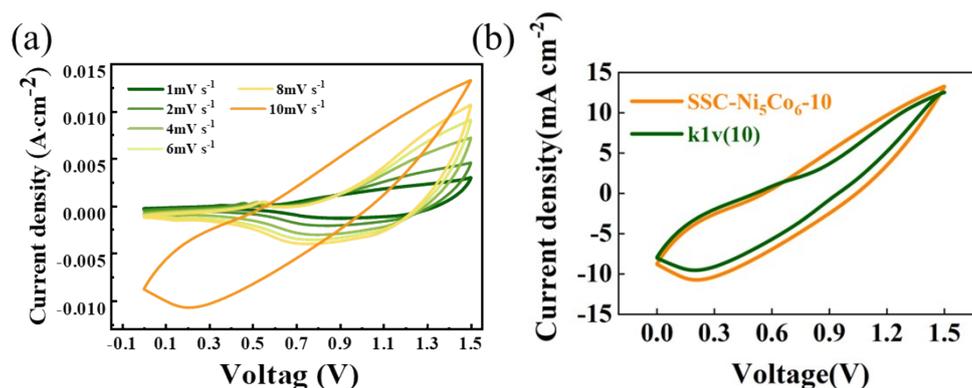


Fig. S9 (a) CV curves of SSC-Ni<sub>5</sub>Co<sub>6</sub>-10 at different current densities, (b) CV profile for SSC-Ni<sub>5</sub>Co<sub>6</sub>-10 showing capacitive charge storage contribution performed at 10 mV s<sup>-1</sup>.