

## Supporting Information

### **Design Mass-controllable NiCo<sub>2</sub>S<sub>4</sub>/Ketjen Black Nanocomposite Electrodes for High performance Supercapacitors**

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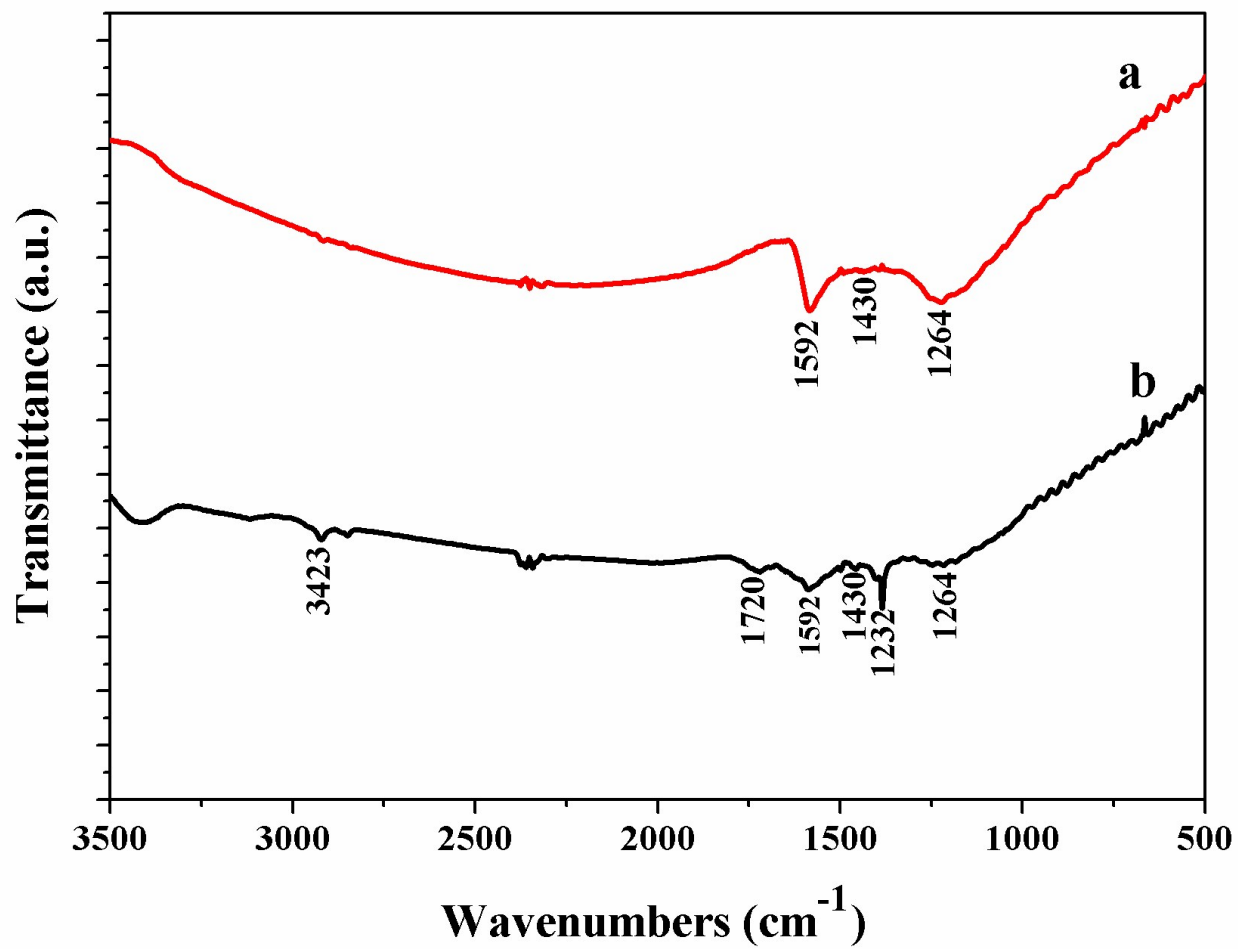


Fig.S1 The FT-IR spectrum of KB (a) and m-KB (b).

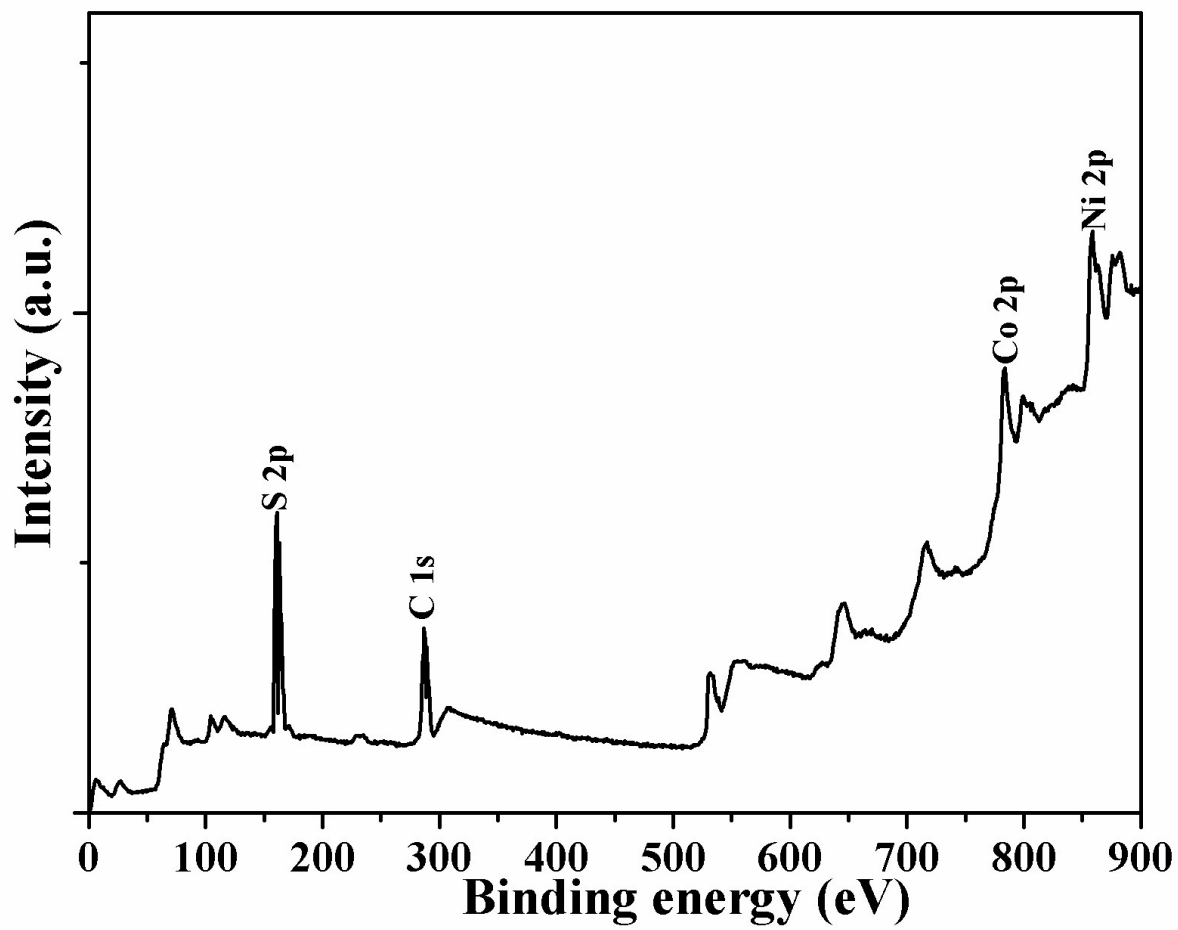


Fig. S2 XPS spectrum of the NiCo<sub>2</sub>S<sub>4</sub>/KB nanocomposite (survey spectrum)

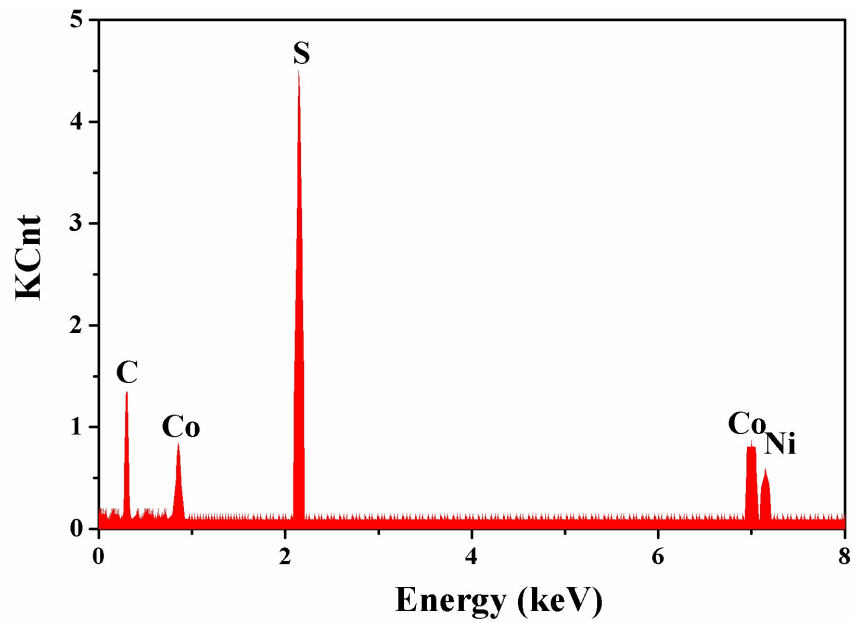


Fig.S3 EDS pattern of the NiCo<sub>2</sub>S<sub>4</sub>/KB nanocomposite in the section of g1 (Fig.3g).

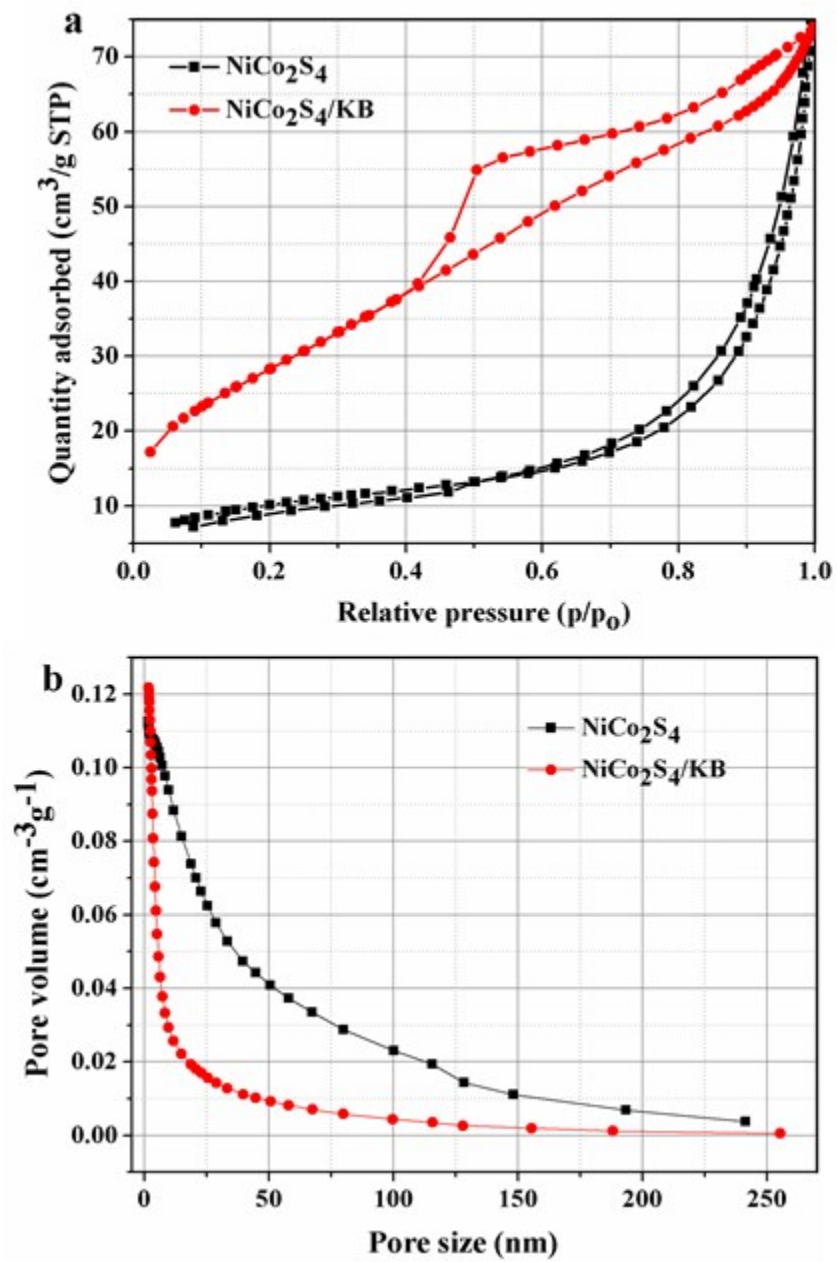


Fig.S4 (a)  $\text{N}_2$  adsorption-desorption isotherm and (b) the pore size distribution of  $\text{NiCo}_2\text{S}_4$  and  $\text{NiCo}_2\text{S}_4/\text{KB}$  composite

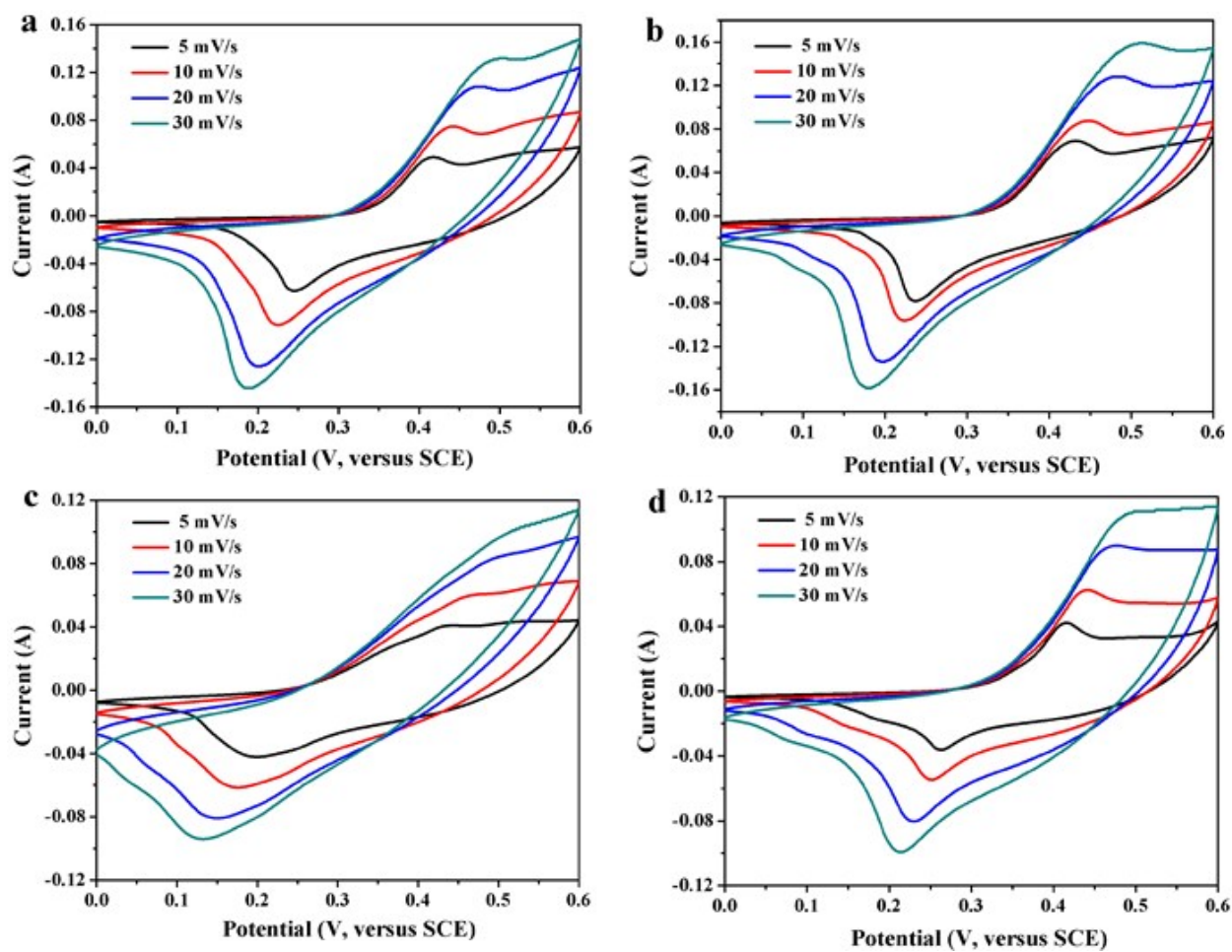


Fig.S5 CV spectrum of  $\text{Ni}_1\text{K}_{0.5}$ ,  $\text{Ni}_1\text{K}_{0.25}$ ,  $\text{Ni}_1\text{K}_{0.125}$  and  $\text{Ni}_1\text{K}_0$  at scan rates between 5 and 30  $\text{mV s}^{-1}$ , respectively

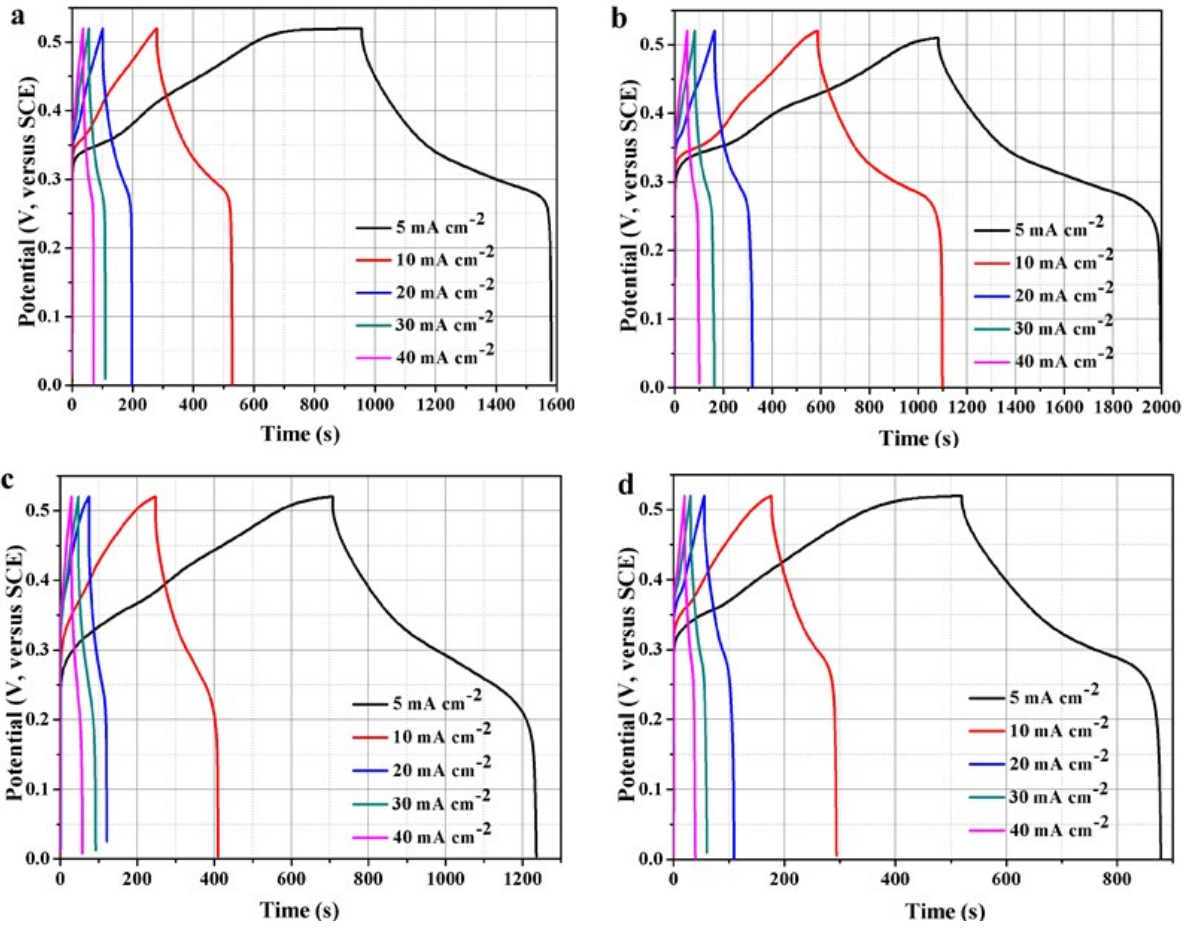


Fig.S6 Charge and discharge curves of  $\text{Ni}_1\text{K}_{0.5}$ ,  $\text{Ni}_1\text{K}_{0.25}$ ,  $\text{Ni}_1\text{K}_{0.125}$  and  $\text{Ni}_1\text{K}_0$  at current densities between 5 and 40 mA cm<sup>-2</sup>, respectively

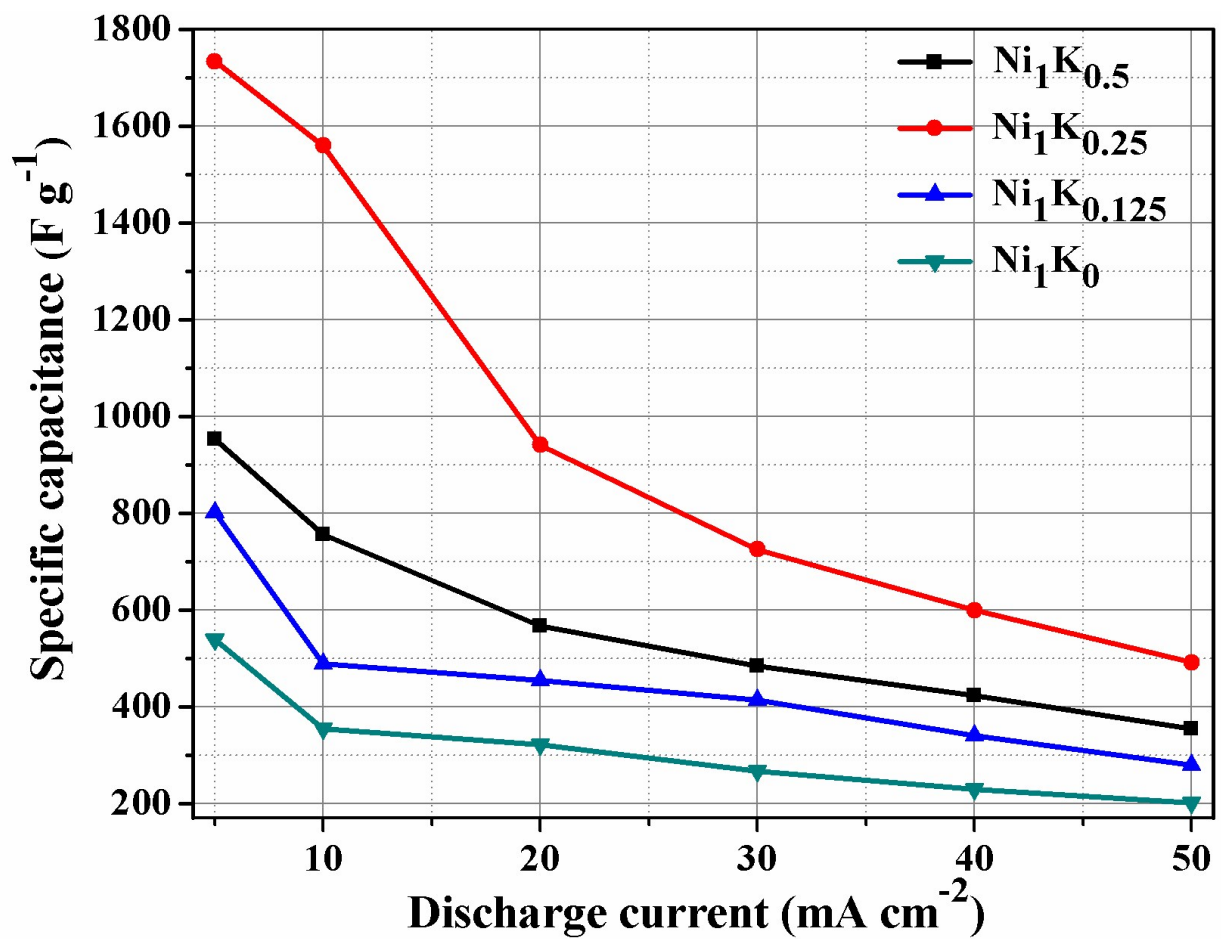


Fig.S7 Gravimetric specific capacitance of Ni<sub>1</sub>K<sub>0.5</sub>, Ni<sub>1</sub>K<sub>0.25</sub>, Ni<sub>1</sub>K<sub>0.125</sub> and Ni<sub>1</sub>K<sub>0</sub> at current densities between 5 and 50 mA cm<sup>-2</sup>, respectively



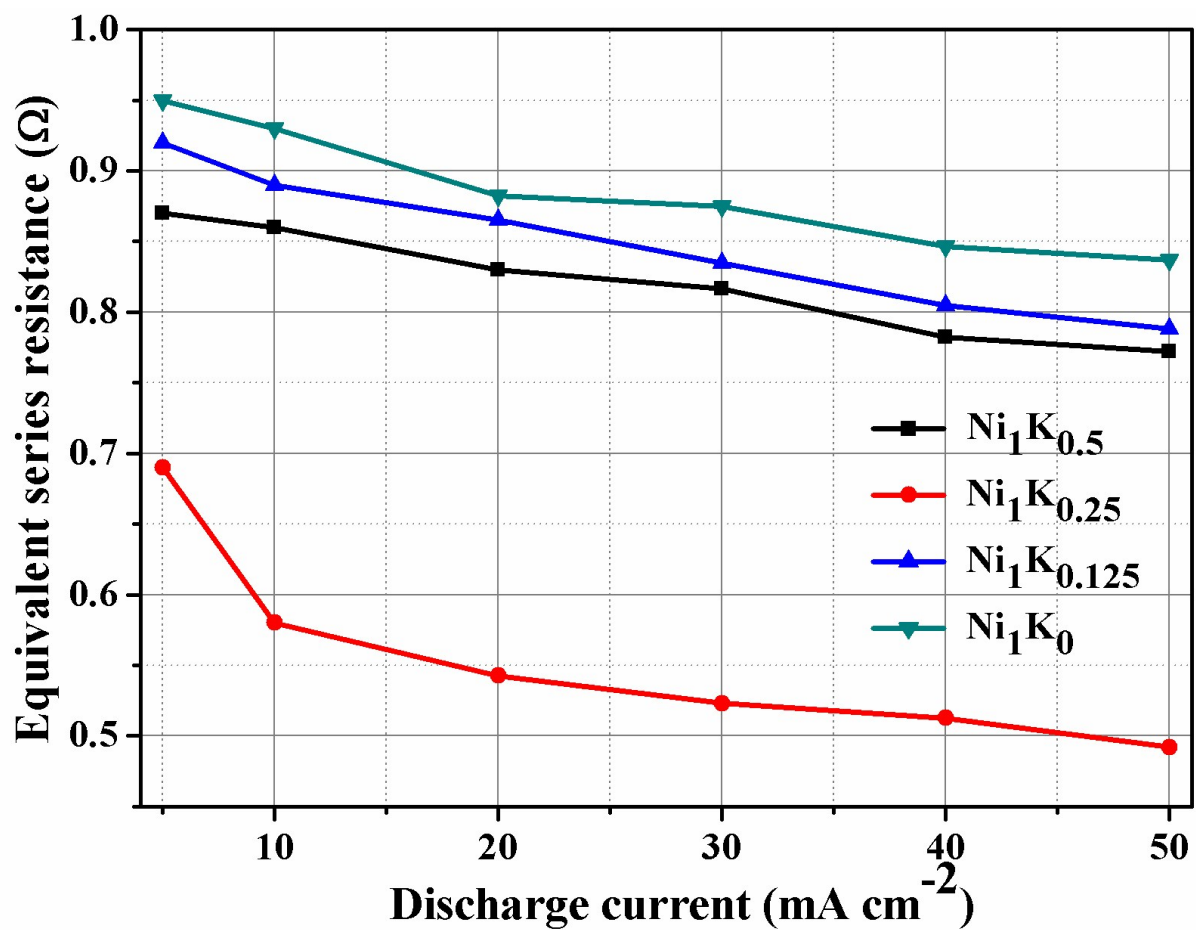


Fig.S8 ESR of Ni<sub>1</sub>K<sub>0.5</sub>, Ni<sub>1</sub>K<sub>0.25</sub>, Ni<sub>1</sub>K<sub>0.125</sub> and Ni<sub>1</sub>K<sub>0</sub> at current densities between 5 and 50 mA cm<sup>-2</sup>, respectively

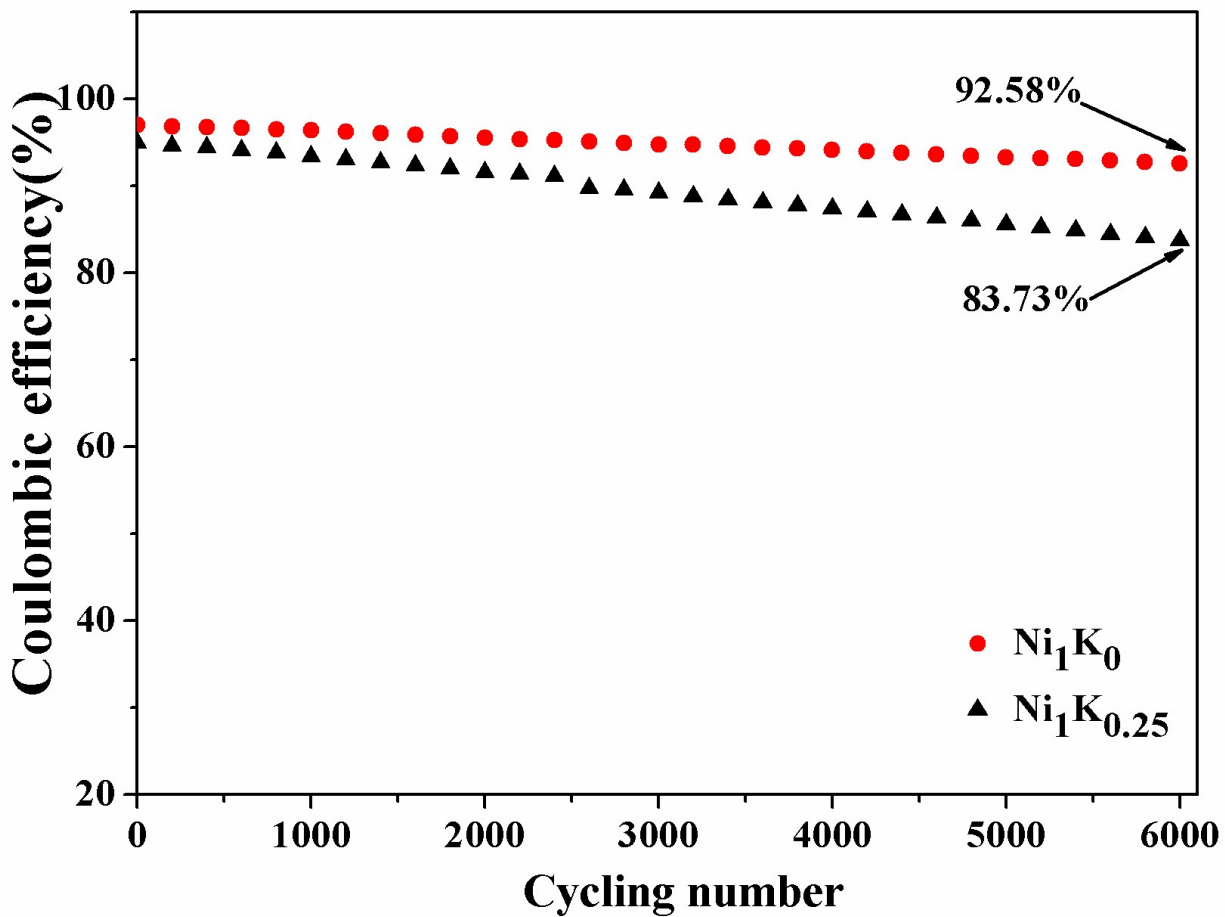


Fig.S9 Coulombic efficiency of  $\text{Ni}_1\text{K}_{0.25}$  and  $\text{Ni}_1\text{K}_0$  for 6000 cycles at  $10 \text{ mA cm}^{-2}$

Tab.S1 Literature survey for related NiCo<sub>2</sub>S<sub>4</sub>-based electrodes

Samples	Synthesis method	Specific capacitance	Mass loading
NiCo <sub>2</sub> S <sub>4</sub> nanowire arrays <sup>38</sup>	Hydrothermal	4.1 F cm <sup>-2</sup> (10 mA cm <sup>-2</sup> )	2.5 mg cm <sup>-2</sup>
NiCo <sub>2</sub> S <sub>4</sub> nanotube arrays <sup>18</sup>	Hydrothermal	3.1 F cm <sup>-2</sup> (16.8 mA cm <sup>-2</sup> )	4.2 mg cm <sup>-2</sup>
NiCo <sub>2</sub> S <sub>4</sub> nanotube arrays <sup>15</sup>	Hydrothermal	2.86 F cm <sup>-2</sup> (4 mA cm <sup>-2</sup> )	4.3 mg cm <sup>-2</sup>
Urchin-like NiCo <sub>2</sub> S <sub>4</sub> nonastructure <sup>13</sup>	Hydrothermal	2.30 F cm <sup>-2</sup> (2 mA cm <sup>-2</sup> )	4.2 mg cm <sup>-2</sup>
3D cauliflower-like NiCo <sub>2</sub> S <sub>4</sub> architecture <sup>23</sup>	Microwave-assisted method	7.355 F cm <sup>-2</sup> (5 mA cm <sup>-2</sup> )	5.0 mg cm <sup>-2</sup>
NiCo <sub>2</sub> S <sub>4</sub> nanoplate <sup>36</sup>	Hydrothermal	1.05 F cm <sup>-2</sup> (2.4 mA cm <sup>-2</sup> )	2.4 mg cm <sup>-2</sup>