Facilitating rapid ion transport and boosting redox kinetics in Yb/NiCo-LDH composite for enhanced supercapacitor performance

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1. Experimental

1.1 Material characterizations

The X-ray diffraction (XRD) patterns of the sample materials were obtained using a D/MAX-2500 X-ray diffractometer with Cu Kα radiation (λ = 1.54056 Å), scanning in the range of 10° to 80°. The surface morphology and detailed structural features of the samples were investigated using field-emission scanning electron microscopy (FESEM, S-4800), transmission electron microscopy (TEM), and high-resolution transmission electron microscopy (HRTEM). To analyze the valence states and elemental composition of the electrode materials, X-ray photoelectron spectroscopy (XPS) was performed using an ESCALAB 250X system (USA). The specific surface area of Yb/NiCoLDH nanocomposites was measured using the BET (Brunauer-Emmett-Teller) method, which involved nitrogen adsorption and desorption measurements with a Micromeritics ASAP 2460 instrument. The pore size distribution and pore diameter were determined using the Barrett-Joyner-Halenda (BJH) method.

2. Result and discussion

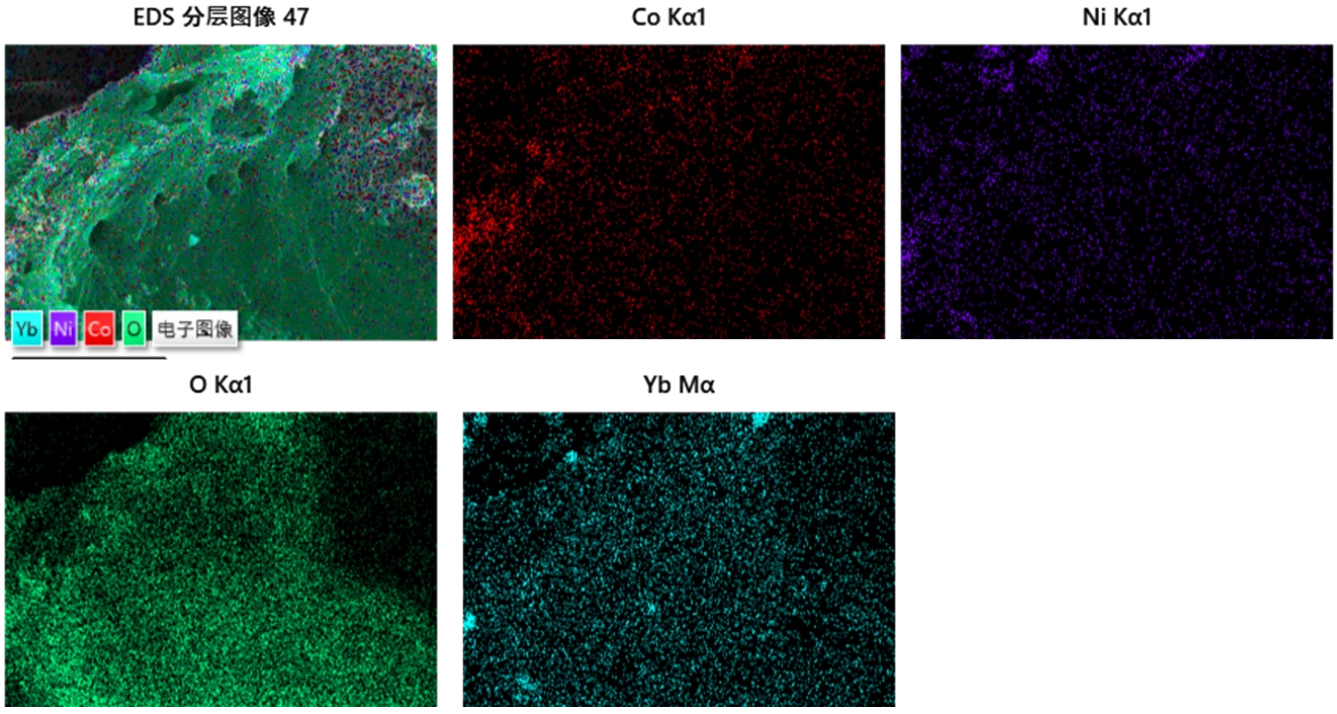

Fig. S1. Show the EDS elemental mapping of Yb2.

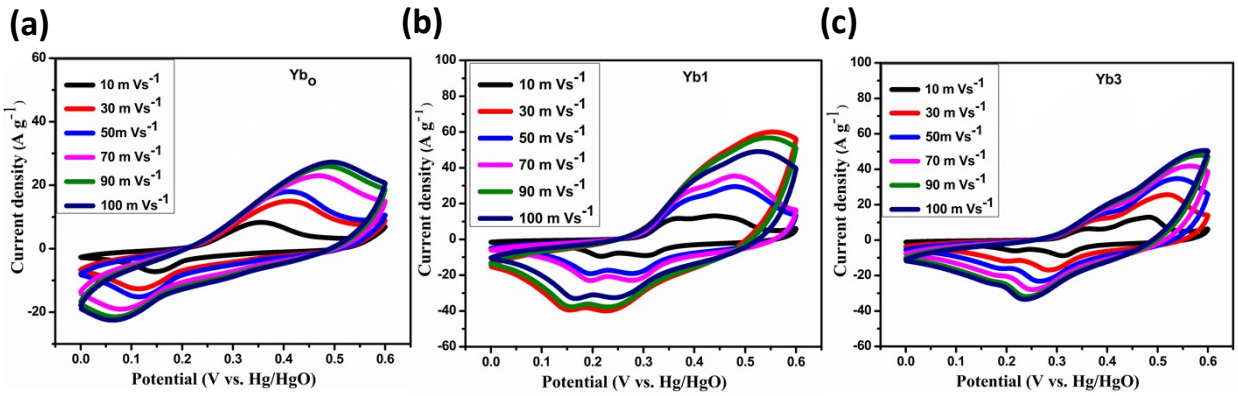

Fig. S2. Presents the CV curves of (a-c) Yb_0, Yb1 and Yb3, respectively.

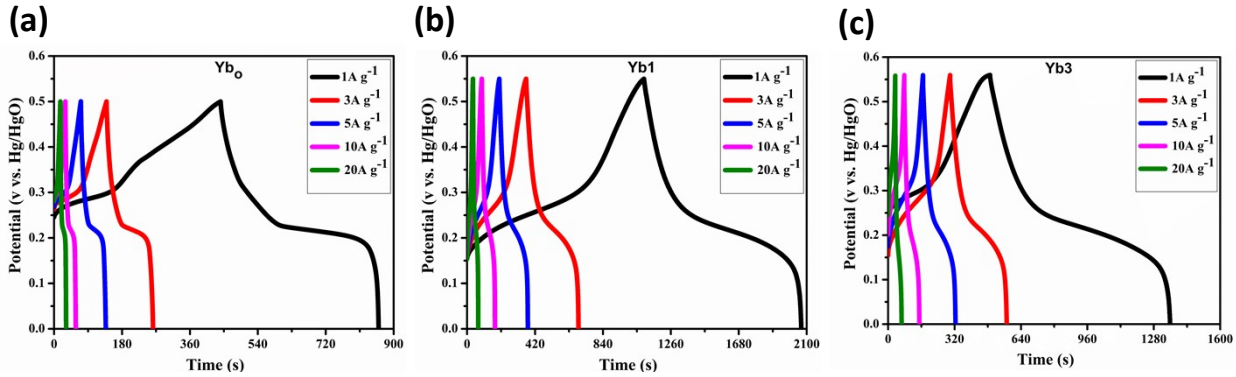

Fig. S3. Show GCD curves of (a-c) Yb_0, Yb1 and Yb3, respectively.