Electronic Supplementary Information (ESI)

Experimental

The Zn-Al-hydrotalcities (Zn-Al-In-LDHs) and Zn-Al-In-hydrotalcities (Zn-Al-In-LDHs) were prepared by hydrothermal method. An aqueous solution (100 ml) of Zn, Al and In nitrates (with Zn: Al: In molar ratio equal to 4:1:0 and 4:0.8:0.2) and total metal ion concentration of 0.25 mol L^{-1} was added with flow rate of 5 ml min^{-1} into reactor containing 50 ml of distilled water. The flow rate of simultaneously added alkaline solution (100 mL) of Na_2CO_3 (0.0125 mol) and NaOH (0.05 mol) was controlled to maintain the reaction pH of 10. The process was carried out under vigorous stirring at 45℃, then transferred the above reaction solution to a reaction kettle and kept it in thermostatic drying closet, reacting at 120℃ for ten hours, filtering, washing and vacuum drying at 60℃. The products of Zn-Al-LDHs and Zn-Al-In-LDHs powders were successfully obtained for further examination and use.

Fourier transform infrared spectra (FT-IR) of the samples were conducted on a Nicolet Nexus-670 FT-IR spectrometer (as KBr discs, with wave number 400−4000 cm^{-1}, resolution 0.09 cm^{-1}, and the weight of measured sample 2 mg). XRD patterns of samples were recorded by a D500 (Siemens) diffractometer (36 kV, 30 mA) using Cu Kα radiation at a scanning rate of $2\theta=8°min^{-1}$. The morphology of the Zn-Al-In-LDHs product was examined by SEM (JSM-6360LV) and TEM (JEM-2100F).

The Zn-Al-In-LDHs electrodes were prepared by incorporation slurries[10] containing 85 wt.% Zn-Al-In-LDHs, 10 wt.% acetylene black and 5 wt.% additives of

polytetrafluoroethylene (PTFE, 60 wt.%, in diluted emulsion). Copper mesh (1.0 cm×1.0 cm in size) was served as the current collector and the Zn-Al-In-LDHs electrodes were roll-pressed to a thickness of 0.2 mm. Then, the obtained Zn-Al-In-LDHs electrodes were dried at 60 °C under vacuum. The positive electrode was the commercial sintered $Ni(OH)_2$ electrode (Tianjin City Fine Chemical Research Institute). The electrolyte is solution of 6 M KOH saturated with ZnO. The Zn-Al-LDHs electrodes were prepared as the same method. All the cells were pre-activated for 10 times by the following operations: The cells were charged at constant current of 1C for 60 min, and discharged at constant current of 1C to a cut-off voltage of 1.2 V.

The galvanostatic charge-discharge tests were performed on a BTS-5V/10mA battery-testing instrument (Neware, China) at room temperature. During the cycling process, the cells were charged at 1 C for 60 min and discharged at 1 C down to 1.2 V cut-off voltages.