Supporting Information

A macroporous LiFePO$_4$ as a cathode for an aqueous rechargeable lithium battery of high energy density

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1. The SEM micrograph of the PS template

![SEM micrograph of the PS template](image)

**Figure S1.** SEM micrograph of the PS template to prepare three dimensional (3D)-ordered macroporous LiFePO$_4$.

The SEM of the PS template is shown in **Figure S1**. The stacking of the PS particles is three-dimensionally regular and the shapes of the pores are very uniform. The PS particle size is about 200 nm.

2. Cycling behaviour of the LiFePO$_4$ cathode in 0.5 mol l$^{-1}$ Li$_2$SO$_4$ aqueous solution

![Cycling behaviour graph](image)

**Figure S2.** Cycling behaviour of the LiFePO$_4$ cathode in 0.5 mol l$^{-1}$ Li$_2$SO$_4$ aqueous solution at the current density of 1000 mA g$^{-1}$.

Cycling behaviour of the LiFePO$_4$ cathode in 0.5 mol l$^{-1}$ Li$_2$SO$_4$ aqueous solution at the current density of 1000 mA g$^{-1}$ is shown in **Figure S2**, which was tested using activated carbon as the counter electrode and SCE as the reference electrode. It shows clearly that the LiFePO$_4$ in the aqueous solution presents good cycling behaviour as in the aqueous electrolytes.
3. The “cross-over” effect of Li$^+$ ions in the composite coating

**Figure S3** Schematic illustration of the “cross-over” effect of Li$^+$ ions in the composite coating.