

Supplementary Information

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As shown in Fig. S1, the cyclic voltammograms (CV) of LiFePO₄/CNT electrode was tested at 0.1, 0.5 and 1.0 mV/s, respectively. For the diffusion-limited process, the peak current is proportional to the square roots of the scan rate ($v^{-1/2}$) as the following Randles–Sevcik equation:¹

$$I_p = (2.69 \times 10^5) n^{3/2} AD^{1/2} C v^{1/2} \quad (1)$$

Where n is the number of transfer electrons ($n = 1$ for Fe²⁺/Fe³⁺ redox pair); A is the surface of the electrode; D is the diffusion coefficient; and C is the concentration of reactants. The linear relations shows in Fig. S2 for the LiFePO₄/CNT indicates a diffusion-limited reaction. In addition, the slope of the fitted line is dependent on the diffusion coefficient of Li ion, and $D = 1.12 \times 10^{-10} \text{ cm}^2 \text{ s}^{-1}$ is obtained according to Eq. (1), which is 3 ~ 4 orders higher than bare LiFePO₄ electrode ($10^{-13} \sim 10^{-14} \text{ cm}^2 \text{ s}^{-1}$).² Therefore, the prepared ionic conductivity LiFePO₄/CNT electrode is greatly improved.

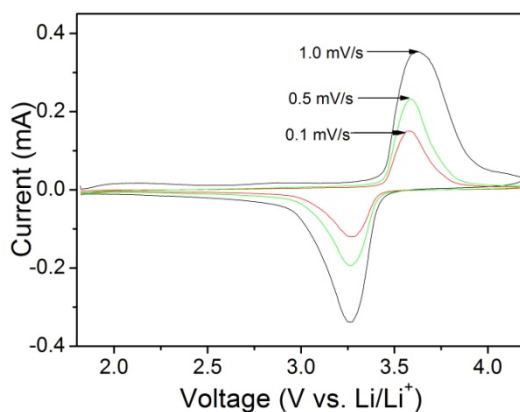


Fig. S1. CV curves of LiFePO₄/CNT electrode at different scanning rates.

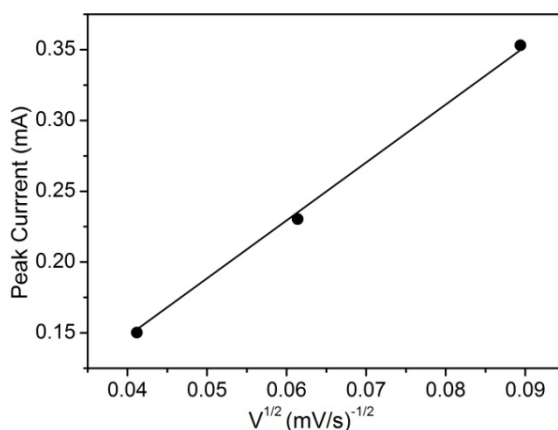


Fig. S2. The relation between peak current and the square roots of the scan rate.

References

1. K. Tang, X. Yu, J. Sun, H. Li, X. Huang, *Electrochimica Acta*, **2011**, 56, 4869.
2. S. Franger, F. L. Cras, C. Bourbon and H. Rouault, *Electrochem. Solid-State Lett.*, **2002**, 5, A231.