Supporting Information

Composites of Layered $M(HPO_4)_2$ (M = Zr, Sn, and Ti) with Reduced Graphene Oxide as Anode Materials for Lithium Ion Batteries

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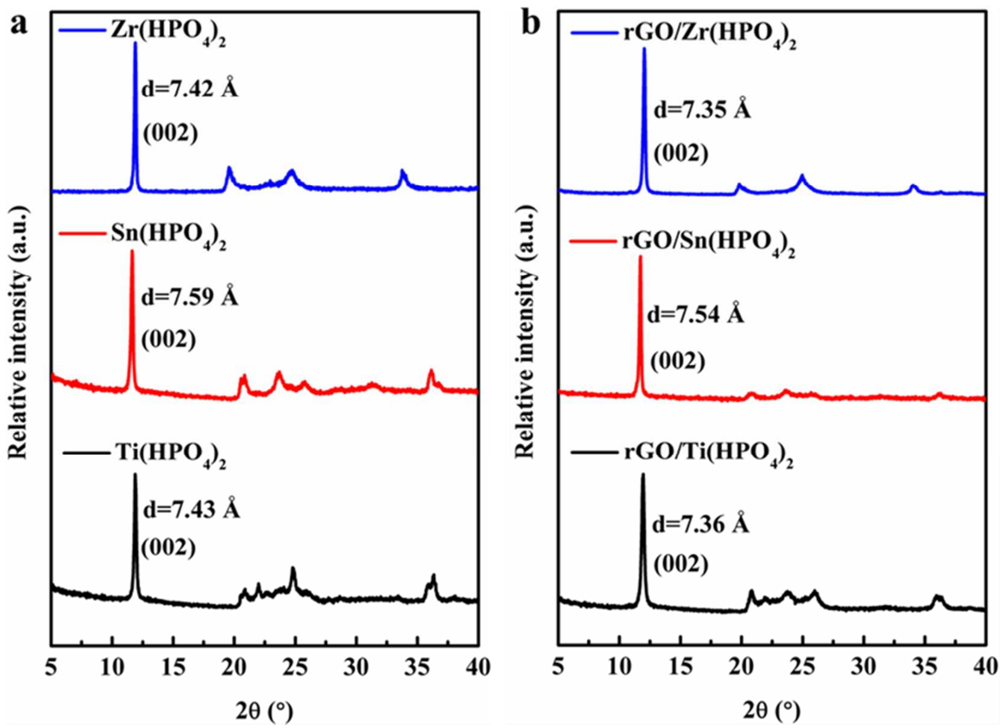

Figure S1. XRD patterns of (a) $M(HPO_4)_2$, and (b) rGO/$M(HPO_4)_2$ with rGO-to-$M(HPO_4)_2$ ratio of 5:100 (in weight). The interlayer d-spacings of the materials are labeled in the Figure.

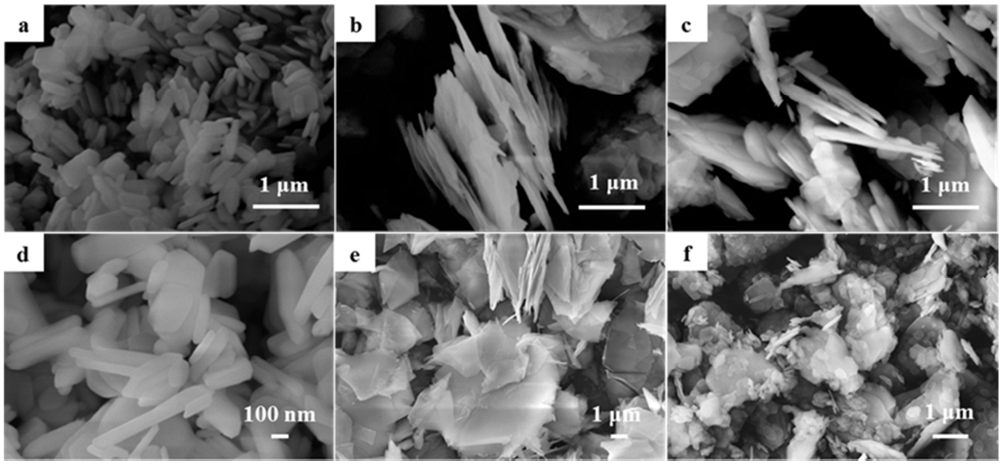

Figure S2. FE-SEM images of metal phosphates hydrates before and after dehydration, (a) $Zr(HPO_4)_2{\cdot}H_2O$, (b) $Sn(HPO_4)_2{\cdot}H_2O$, (c) $Ti(HPO_4)_2{\cdot}H_2O$, (d) $Zr(HPO_4)_2$, (e) $Sn(HPO_4)_2$, and (f) $Ti(HPO_4)_2$, revealing that all three metal phosphates have similar thin flake morphology with the thickness ranged in nanometers and lateral dimensions over a few micrometers.

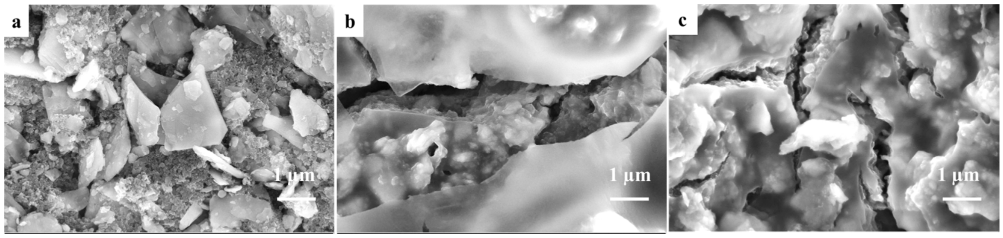

Figure S3. FE-SEM images of the electrodes using rGO/$Sn(HPO_4)_2$ composites with rGO-to-$Sn(HPO_4)_2{\cdot}H_2O$ ratio of 5:100 (in weight) at different charge-discharge states. (a) without charge-discharge process, (b) after 1000 charge-discharge cycles at 1 A g^{-1} and (c) after 1000 charge-discharge at 5 A g^{-1}.

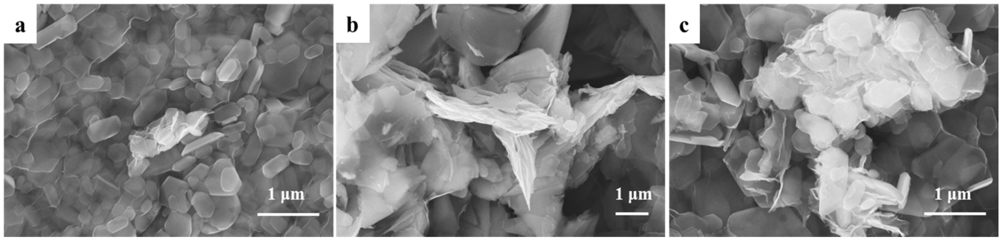

Figure S4. FE-SEM images of (a) rGO/$Zr(HPO_4)_2$ composite with rGO-to-$Zr(HPO_4)_2$ ratio of 20:100 (in weight), (b) rGO/$Sn(HPO_4)_2$ composite with rGO-to-$Sn(HPO_4)_2$ ratio of 10:100 (in weight), and (c) rGO/$Ti(HPO_4)_2$ composite with rGO-to-$Ti(HPO_4)_2$ ratio of 20:100 (in weight).

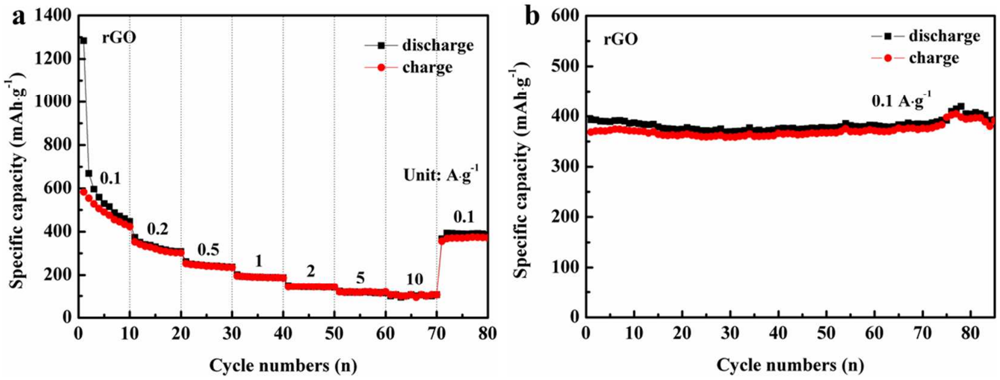

Figure S5. (a) Galvanostatic charge-discharge curves of bare rGO as anode material for LIBs, measured at current densities from 0.1 to 10 A g^{-1}; (b) Cycling performance of rGO anode at 0.1 A g^{-1}.