Electronic Supplementary Information (ESI) for

Large-scale preparation of Mg doped $LiFePO_4$@C for lithium ion batteries via carbon thermal reduction combined with aqueous rheological phase technology

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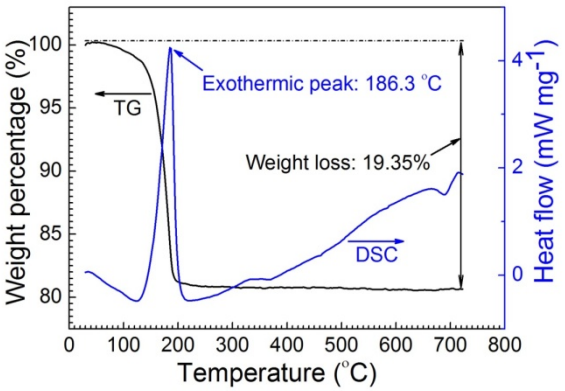

Figure S1. TG-DSC curves of $FePO_4 \cdot 2H_2O$.

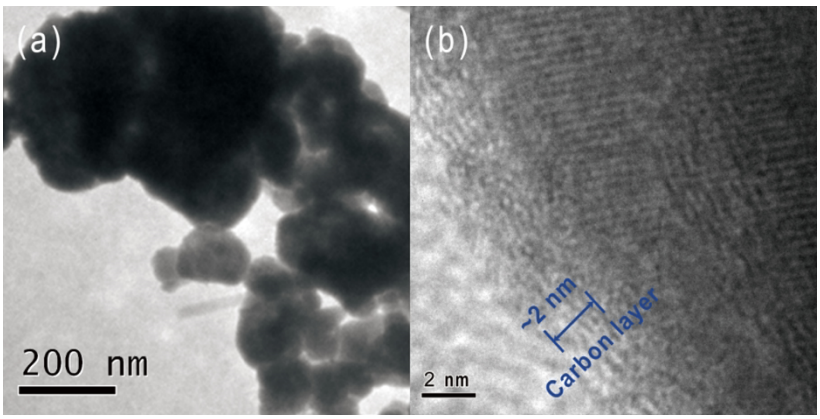

Figure S2. TEM images of the al-LFP.

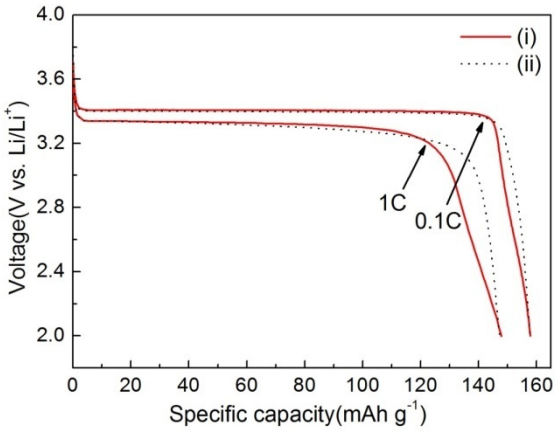

Figure S3. Discharge curves of the al-LFP (i) and the commercial $LiFePO_4$ product (ii).

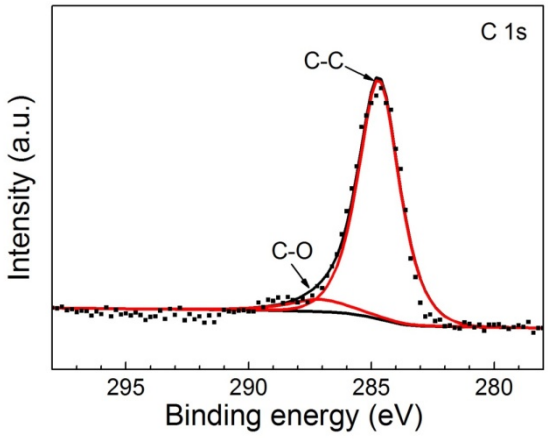

Figure S4. XPS spectra of C1s spectra of the aq-LFP sample.

Table S1. Lattice parameters of the al-LFP and aq-LFP samples, and crystallite sizes calculated by the Scherrer's equation.

Samples	al-LFP	aq-LFP
Lattice constant/Å		
a/Å	10.314(4)	10.312(21)
b/Å	6.000(98)	5.999(55)
c/Å	4.689(82)	4.689(89)
v/Å^3	290.27(4)	290.15(7)
Reliability factors/%		
R_p(%)	11.3	11.1
R_{wp}(%)	7.20	7.02
R_{exp}(%)	5.63	5.75
χ^2	1.63	1.49
R_{Bragg} (%)	5.73	4.93
R_f (%)	4.51	4.01

Table S2. Elemental composition of the al-LFP and aq-LFP samples determined using ICP (the other elements were not calculated*).

Sample	**Li**	**Fe**	**Mg**	**P**
al-LFP	0.97(9)	0.98(4)	0.0093	1
aq-LFP	0.98(7)	0.97(2)	0.0090	1
Recovery rates	1.01	0.987	----	0.985

*Molar ratio was based on element P as 1.