

The Enhanced Rate Performance of $\text{LiFe}_{0.5}\text{Mn}_{0.5}\text{PO}_4/\text{C}$ Cathode Material via Synergistic Strategies of Surfactant-assisted Solid State Method and Carbon Content

Xue Zhou^a, Ye Xie^a, Yuanfu Deng^{*a,b}, Xusong Qin^b and Guohua Chen^{*b,c}

¹ *The Key Laboratory of Fuel Cell Technology of Guangdong province, School of Chemistry and Chemical Engineering, South China University of Technology, Guangzhou, China*

² *Center for Green Products and Processing Technologies, Guangzhou HKUST Fok Ying Tung Research Institute, Guangzhou 511458, China;*

³ *Department of Chemical and Biomolecular Engineering, The Hong Kong University of Science and Technology, Hong Kong, China.*

*Corresponding authors. Tel.: + 86 20 34685680, Fax: + 86 20 34685679

E-mail address: chyfdeng@scut.edu.cn; kechengh@ust.hk.

Figure captions

Fig. S1. The HR-TEM image of the LFMP-S3 composite.

Fig. S2. The EDS mapping analysis of LFMP-S3.

Fig. S3. TEM image for LFMP-S2 composite.

Fig. S4. HR-SEM image for LFMP-S1 composite.

Fig. S5. Cycling performance at 1 and 5-C rate of LFMP-S2 composite.

Fig. S6. The CVs at different scan rates for the coin cell made with LFMP-S1 composite.

Fig. S7. The CVs at different scan rates for the coin cell made with LFMP-S2 composite.

Table S1. Composition analysis data of the three various LFMP samples by the EDS data.

Table S2. Comparison of rate performance of previously reported $\text{LiFe}_{0.5}\text{Mn}_{0.5}\text{PO}_4/\text{C}$ materials.

Fig. S1

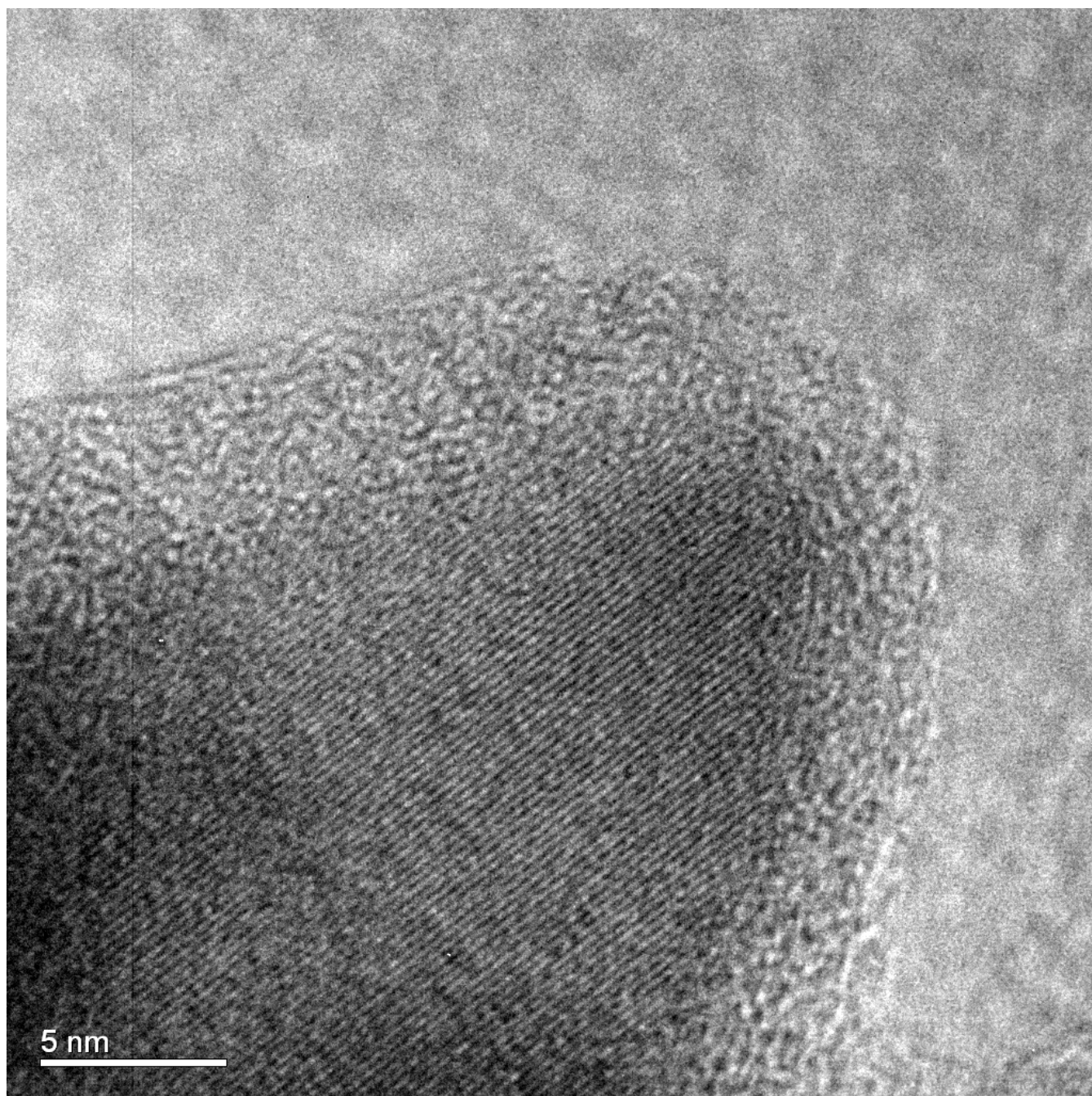


Fig. S2

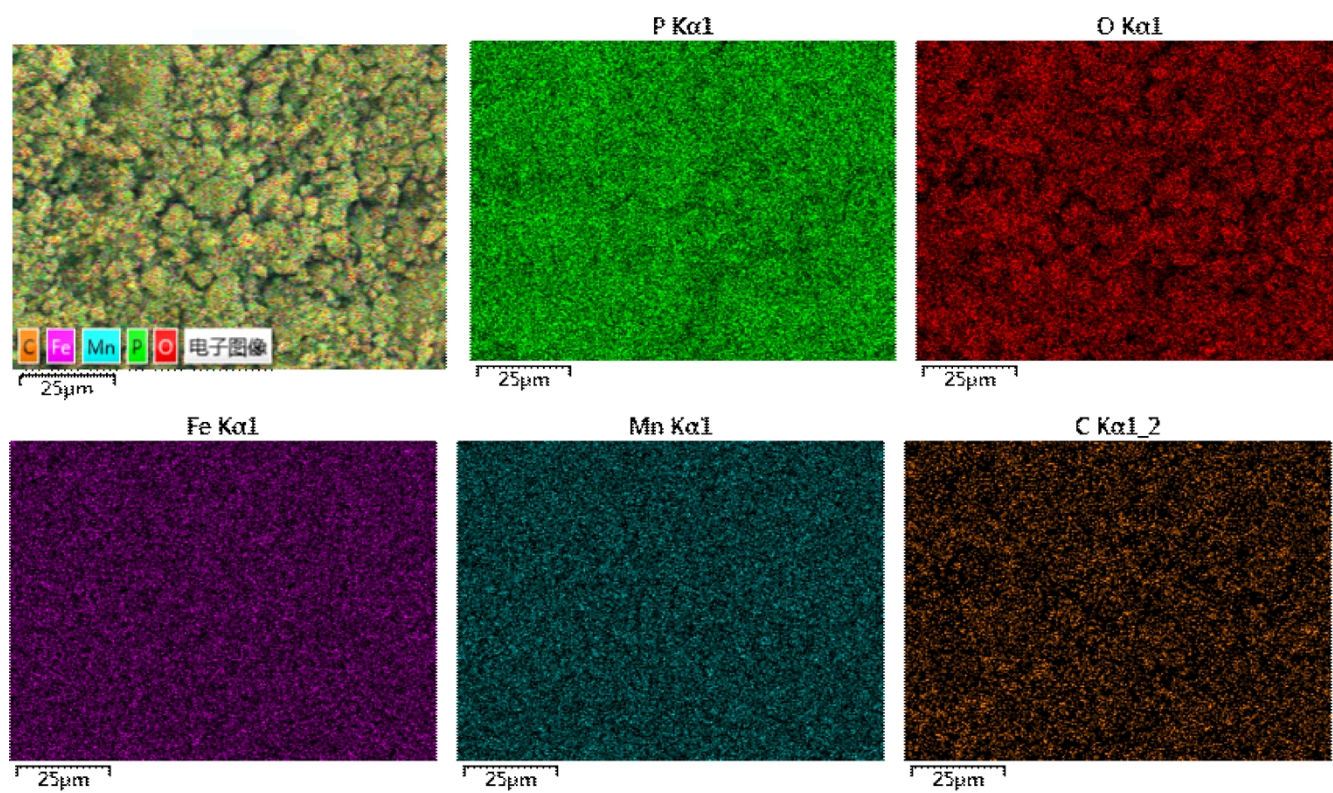


Fig. S3

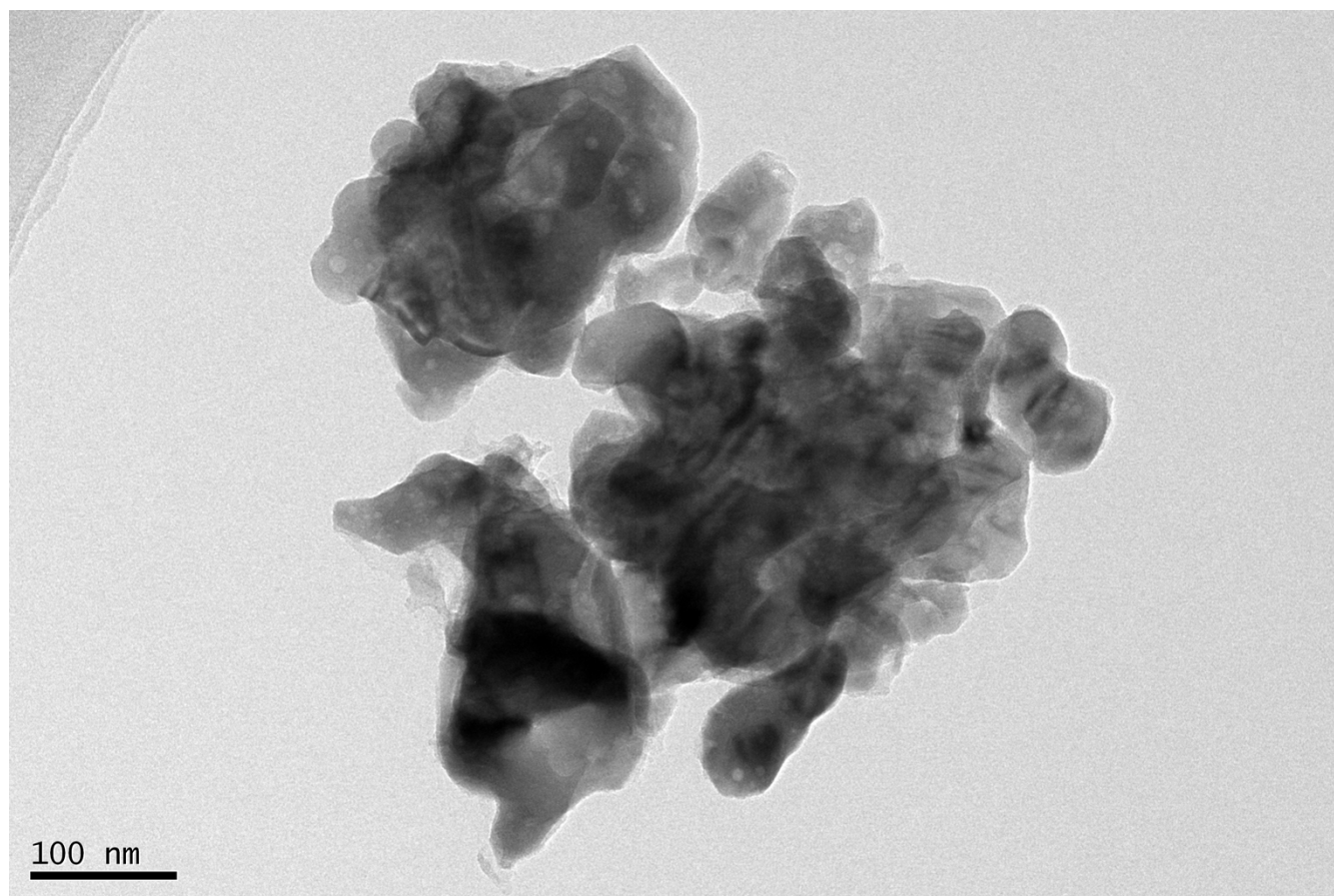


Fig. S4

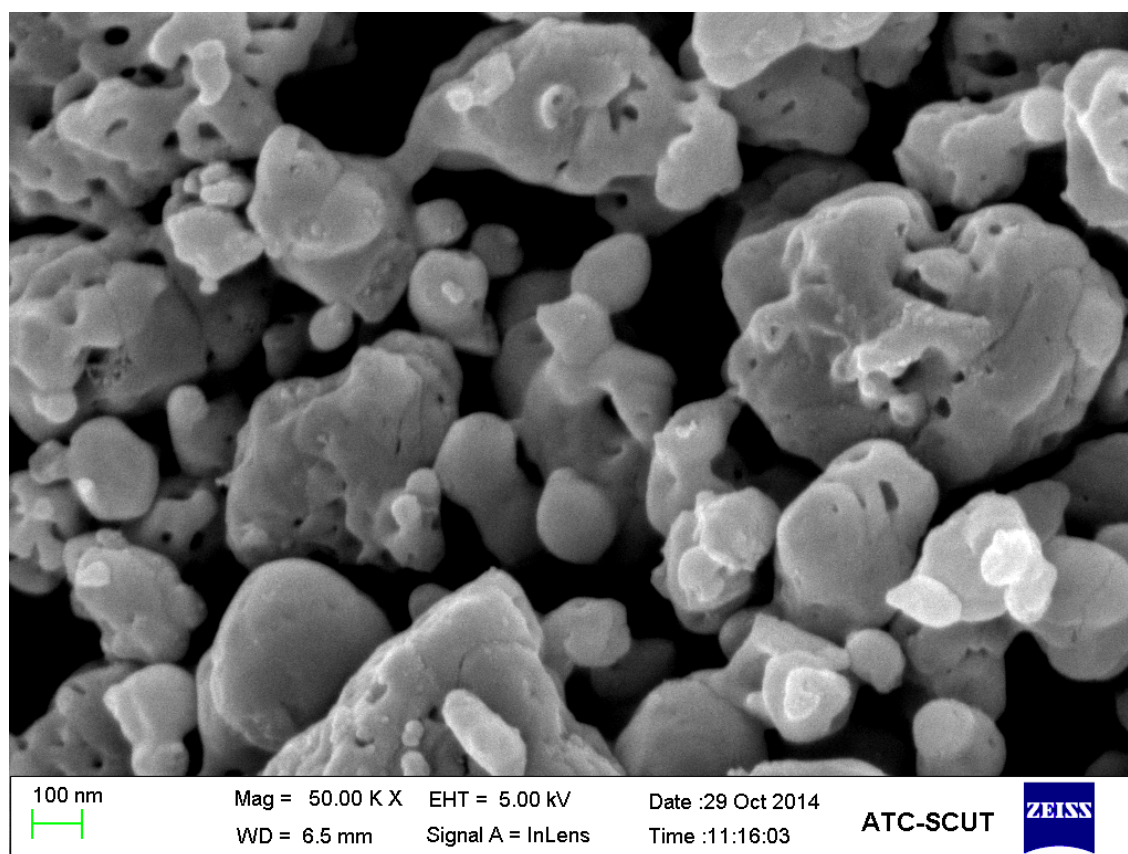


Fig. S5

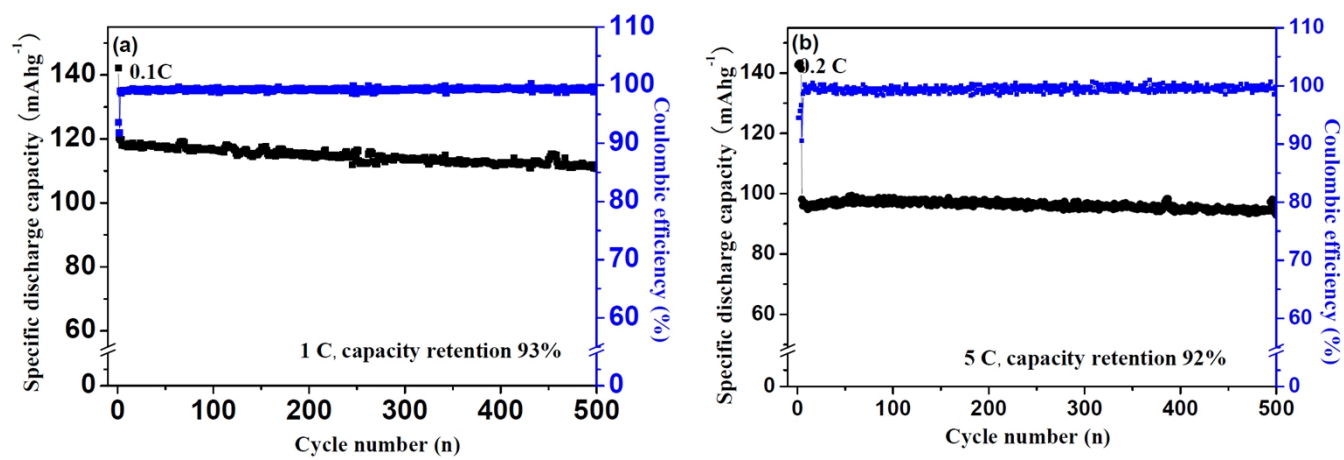


Fig. S6

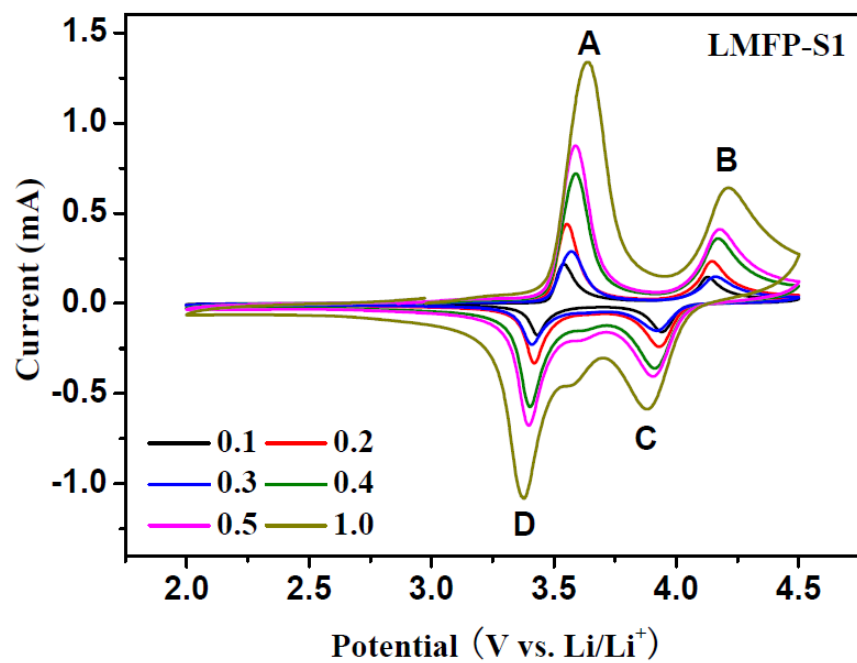


Fig. S7

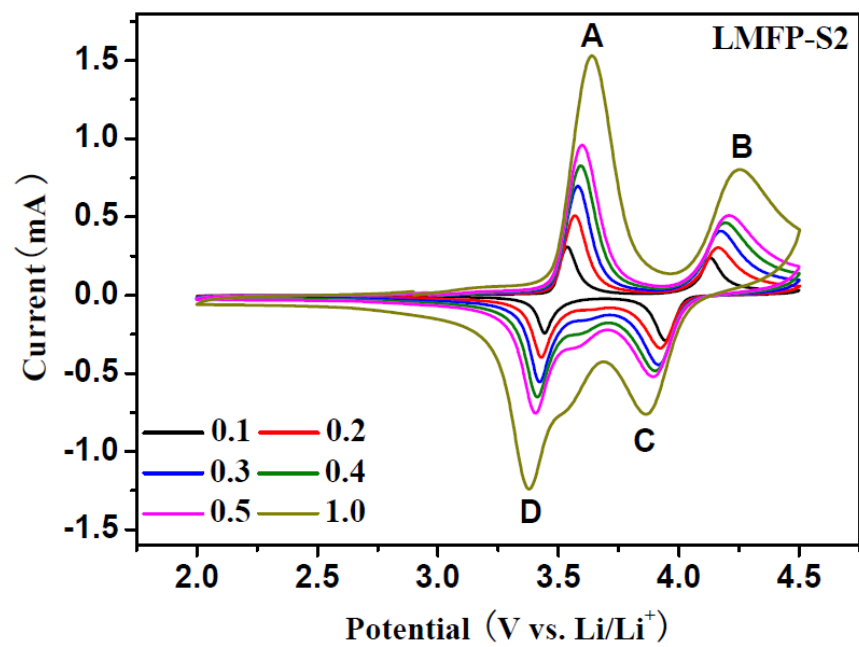


Table S1

Samples	Element content		
	P	Fe	Mn
LFMP-S1	0.96	0.5	0.48
LFMP-S2	0.97	0.5	0.48
LFMP-S3	0.98	0.5	0.49

Table S2

Materials	Capacity (mAh g ⁻¹)	Rate performance (mAh g ⁻¹)	Ref.
LiFe _{0.5} Mn _{0.5} PO ₄ /C nanoparticles with 20% conductive agent	148@ 0.05 C	No data	20
LiFe _{0.5} Mn _{0.5} PO ₄ /C nanoplates	121@0.1 C	103@2 C	21
LiFe _{0.5} Mn _{0.5} PO ₄ /C nanofibers	123@0.05 C	101@4 C	22
LiFe _{0.5} Mn _{0.5} PO ₄ /C micrpspheres	142@0.05 C	120@0.5 C	23
LiFe _{0.5} Mn _{0.5} PO ₄ /C nanoparticles	150@0.2 C	120@10 C	24
LiFe _{0.5} Mn _{0.5} PO ₄ /C nanoparticles	138@0.1 C	70@5 C	25
LFMP-S1 nanoparticles	155@0.1 C	120@5 C	This work
LFMP-S2 nanoparticles	143@0.1 C	98@5 C	
LFMP-S3 nanoparticles	130@0.1 C	85@5 C	