Electronic Supplementary Information

Hydrothermal synthesis, Evolution, and Electrochemical Performance of LiMn$_{0.5}$Fe$_{0.5}$PO$_4$ Nanostructures

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Supplementary Figures

Fig. S1 EDS maps of Fe, Mn, P, O of the intermediates extracted at (a) 30 °C and (b) 100 °C.
Fig. S2 XRD pattern of (a) Li₃PO₄ and the intermediate extracted at (b) 30 ºC, (c) 100 ºC, (d) 110 ºC, (e) 120 ºC, (f) 130 ºC, (g) 135 ºC, (h) 140 ºC during the temperature rise period with resultant concentration of precursor at 0.25mol L⁻¹.
Fig. S3 XRD pattern of LMFP samples synthesized under three different resultant concentration of precursor and corresponding carbon coated samples.
Supplementary Table

**Table S1** Rietveld refinement results of the XRD pattern of intermediate extracted during soaking period

<table>
<thead>
<tr>
<th>Intermediate</th>
<th>a(Å) ± 0.0002</th>
<th>b(Å) ± 0.0002</th>
<th>c(Å) ± 0.0002</th>
<th>V(Å³) ± 0.002</th>
</tr>
</thead>
<tbody>
<tr>
<td>0min</td>
<td>4.7271</td>
<td>10.4057</td>
<td>6.0501</td>
<td>297.597</td>
</tr>
<tr>
<td>10min</td>
<td>4.7251</td>
<td>10.4012</td>
<td>6.0486</td>
<td>297.269</td>
</tr>
<tr>
<td>60min</td>
<td>4.7214</td>
<td>10.3870</td>
<td>6.0443</td>
<td>296.420</td>
</tr>
<tr>
<td>600min</td>
<td>4.7199</td>
<td>10.3784</td>
<td>6.0308</td>
<td>295.419</td>
</tr>
</tbody>
</table>

**Table S2** Atomic composition of LMFP-0.25/C, LMFP-0.5/C and LMFP-0.25/C

<table>
<thead>
<tr>
<th>sample</th>
<th>atomic composition (Li:Mn:Fe:P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMFP-0.25/C</td>
<td>0.93:0.52:0.55:1</td>
</tr>
<tr>
<td>LMFP-0.5/C</td>
<td>0.95:0.52:0.57:1</td>
</tr>
<tr>
<td>LMFP-0.6/C</td>
<td>0.91:0.51:0.58:1</td>
</tr>
</tbody>
</table>