Basic electrochemical performance of pure $LiMnPO_4$: a comparison with selected conventional insertion materials

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Supplementary information

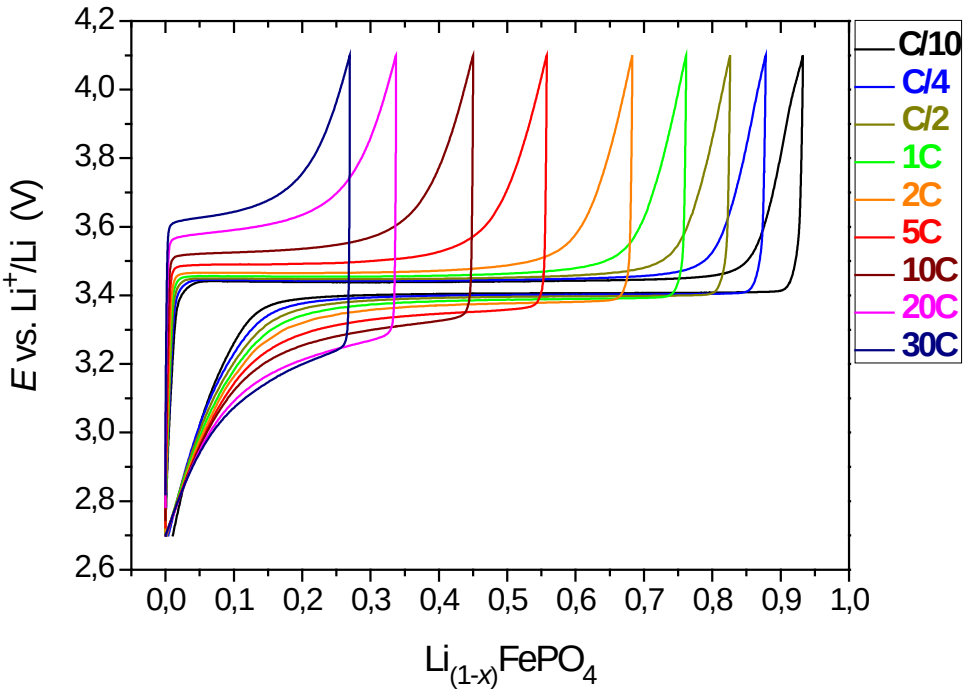

Figure S1. Set of galvanostatic cycles measured on LFP based cell with the "thin" electrode (0.53 mg of $LiFePO_4$ per 1.54 cm^2) using different current densities from C/10 up to 30C in the potential window 2.7 – 4.1 V vs. Li. For all the C-rates the third measured cycle is plotted; all the curves were measured at 25 °C and obtained using the conventional constant-current "CC" cycling protocol.

In order to verify whether the observed non-linear Current-Overpotential dependency might be due to the effect of the electronic and ionic transport within the electrode composites (e.g. due to larger electrode thickness of less dense LFP (~3.5 g/cm^3) compared to LCO (~5 g/cm^3) for the same mass loading per electrode surface area) we prepared very thin LFP electrode (0.53 mg of $LiFePO_4$ per 1.54 cm^2). We measured galvanostatic charge/discharge performance using the same conditions as in the case of LFP cell shown in Figure 1b: from C/10 up to 30C in the potential window 2.7 – 4.1 V vs. Li and using the conventional

constant-current “CC” cycling protocol. The obtained charge/discharge curves are shown in Figure S1 where the 3rd cycle for each rate is plotted.

The “thin” LFP electrode expectedly exhibits comparatively smaller overpotential values practically in the whole current range (C/10 $\rightarrow$ 30C) and more distinctly developed potential plateaus at C-rates 10C and larger compared to the LFP electrode with “regular” thickness (Figure 1b).