

Electronic Supplementary Information

Carbonate anions controlled morphological evolution of LiMnPO_4 crystals

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Cathode fabrication and cell assembly

For cathode fabrication, to generate an efficient conductive carbon coating on the surface of the phosphate particles, the as-prepared powders were ball-milled with 20 wt% of carbon black for 4h and formed LiMnPO_4/C composite. The LiMnPO_4/C composite was mixed with 5 wt.% of carbon black and 5 wt.% of polyvinylidene fluoride in N-methyl pyrrolidinone until a slurry was obtained. Then, the blended slurries were pasted onto an aluminum current collector. The electrode was dried at 100 °C for 10 hours in vacuum. The test cell consisted of cathode and lithium foil anode which were separated by a porous polypropylene film and electrolyte of 1M LiPF_6 in EC:EMC:DMC (1:1:1 in volume). The assembly of the cells was carried out in a dry Ar-filled glove box. The cells were cycled between 2.5 and 4.5 V at a constant current density of 5 mA g⁻¹ at room temperature.

SEM images of the prepared LiMnPO_4

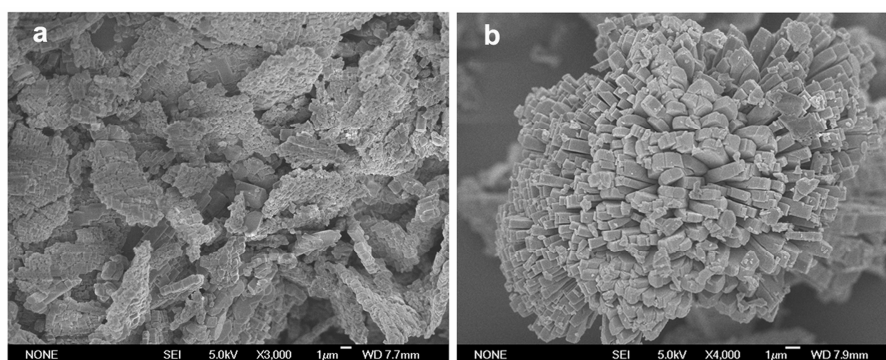


Fig. S1 SEM images of the LiMnPO_4 prepared under different conditions: (a) urea, 10% excess of lithium, (b) urea, 200% excess of lithium.

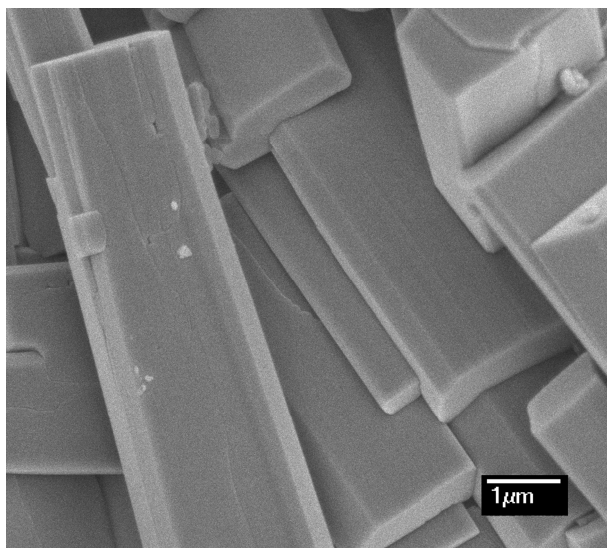


Fig. S2 SEM image of the LiMnPO_4 prepared in degassed water: urea, 10% excess of lithium.

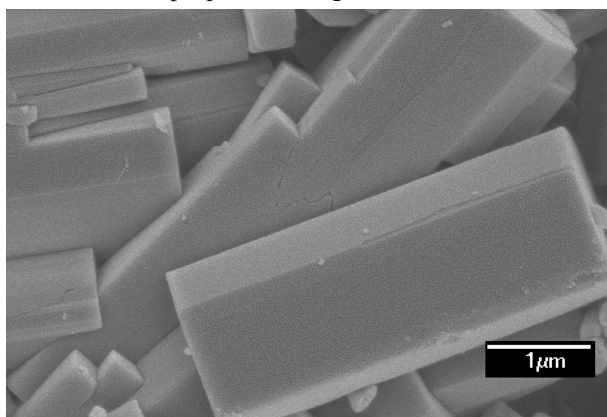


Fig. S3 SEM image of the LiMnPO_4 prepared under CO_2 atmosphere: urea, 10% excess of lithium.

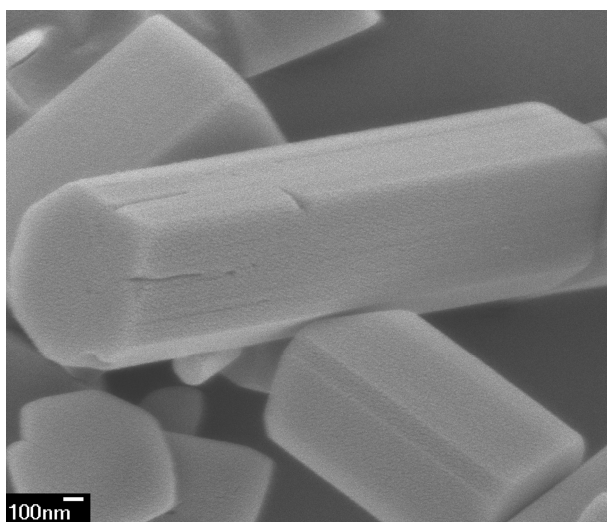


Fig. S4 SEM image of LiMnPO_4 prepared under the conditions: ammonia, 10% excess of lithium, and addition of ammonium bicarbonate (NH_4HCO_3).