Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Well-shaped Mn_3O_4 tetragonal bipyramids with good performance for lithium ion batteries

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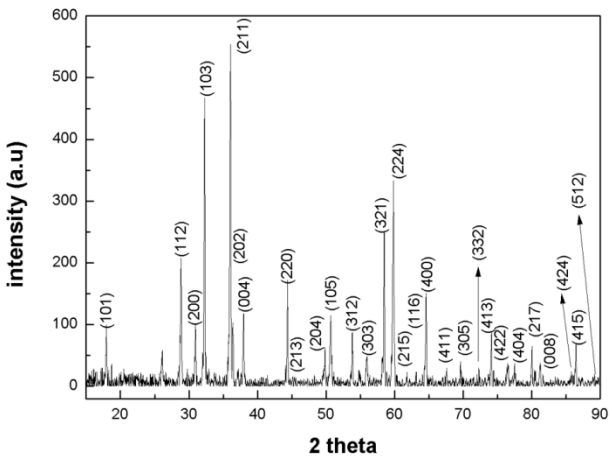

Fig.S1 The X-ray diffraction patterns of the as-prepared product

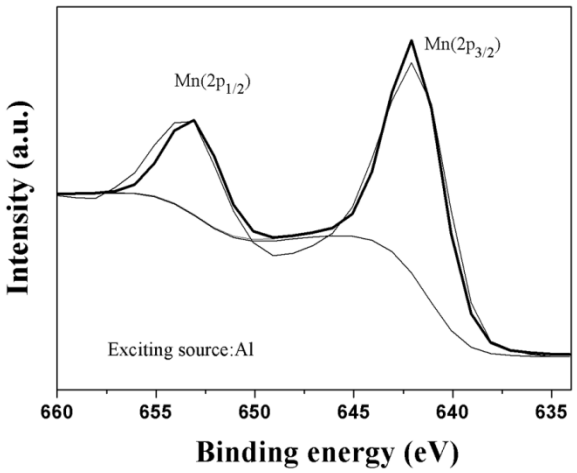

Fig. S2**.** XPS spectra of as-prepared Mn_3O_4

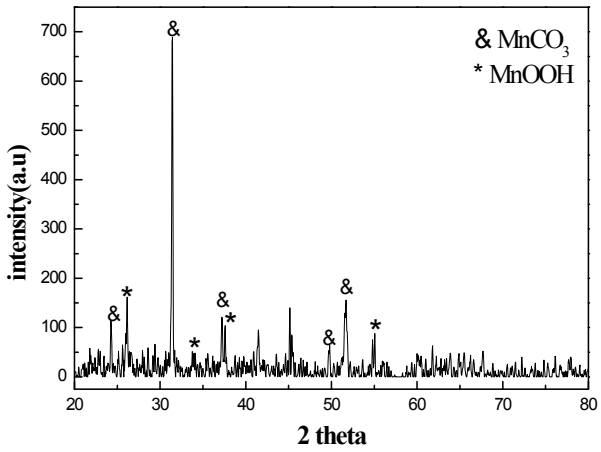

Fig. S3 XRD patterns of the samples recorded at 4h.

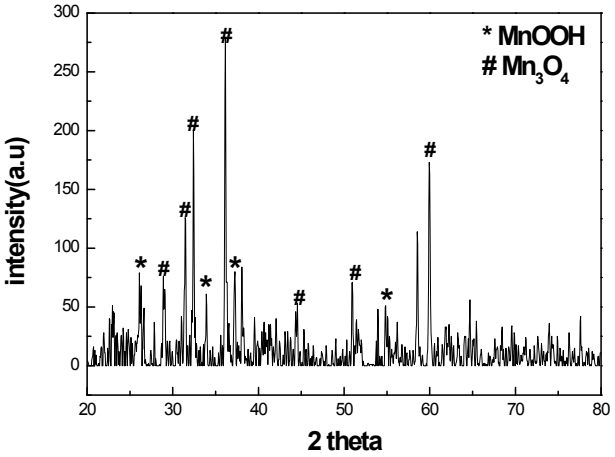

Fig. S4 XRD patterns of the samples prepared at 6 h.

$$MnOOH + H_2O \rightleftharpoons Mn^{3+} + OH^- \quad (1)$$

$$MnCO_3 + H_2O \rightleftharpoons Mn^{2+} + CO_2 + H_2O + OH^- \quad (2)$$

Fig. S5 The chemical reaction equations of $MnCO_3$ and MnOOH.

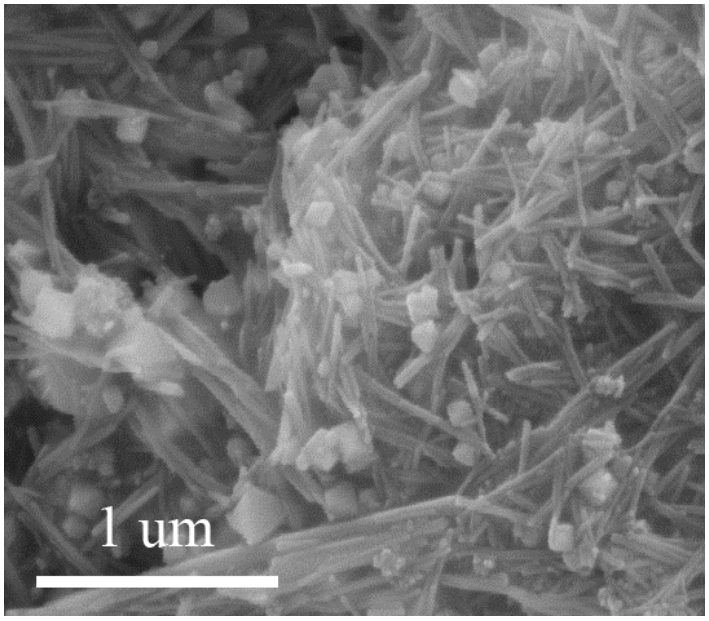

Fig. S6 A SEM image of the samples prepared at 6 h.

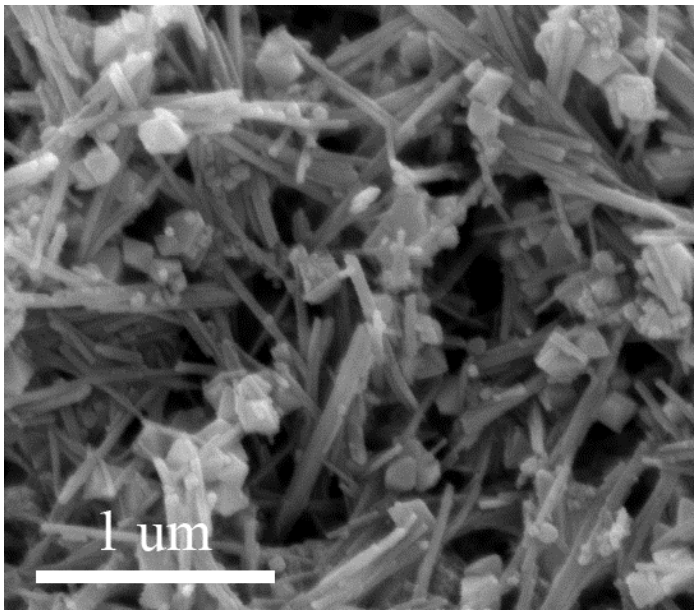

Fig. S7 A SEM image of the samples prepared at 8 h.

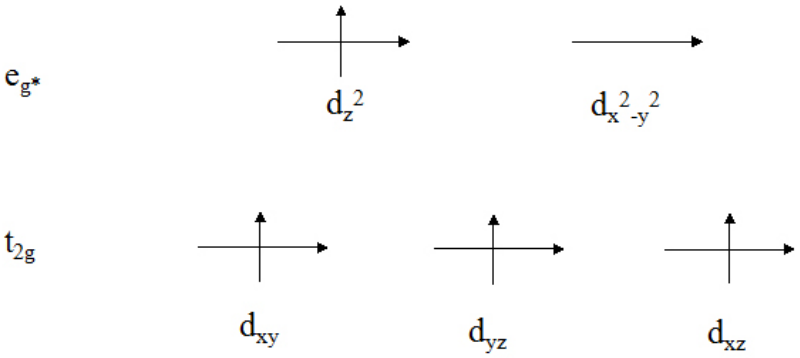

Fig. S8 a schematic diagram of 3d electron filling

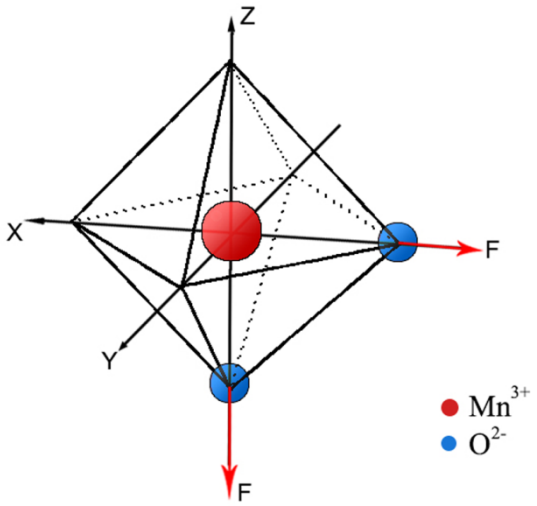

Fig. S9 The force analysis diagram of the two kinds of O^{2-} in the octahedral complexes