Supplementary Material (ESI) for *Nanoscale*

Supplementary information

Hydrothermal synthesis of novel Mn_3O_4 nano-octahedrons with enhanced supercapacitors performances

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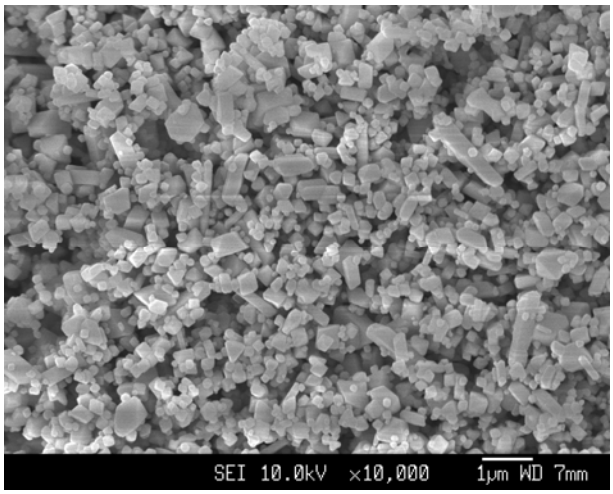


Figure S1 A SEM image of the Mn_3O_4 nanoparticles prepared without the addition of HNO_3.

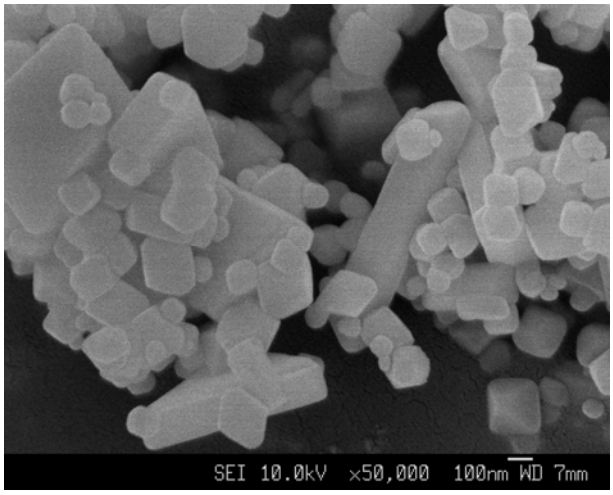
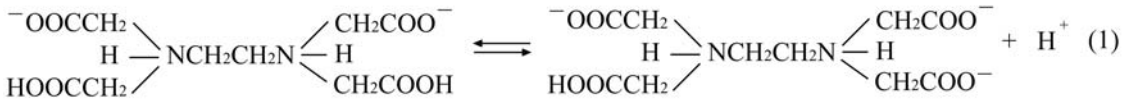
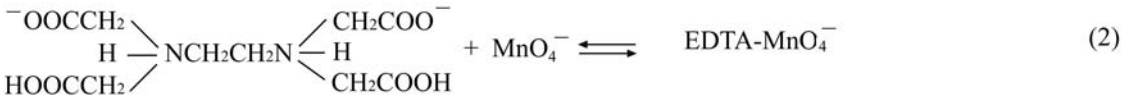
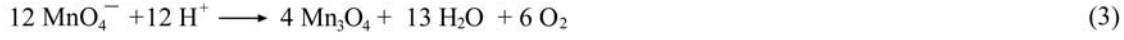


Figure S2 A SEM image of the products when the EDTA-2Na concentration is 0.5 mmol

EDTA-2Na is a strong coordinating agent, which could form a very stable complex by coordinating with MnO^- and modify the growth rate of the Mn_3O_4 crystal by binding crystal facets.[28-30] The chemical reactions can be expressed by the following equations.[28, S1] This was confirmed by the fact that the solution color changed from purple to black brown soon after the addition of EDTA-2Na. Furthermore, we have investigated the effect of EDTA-2Na concentration. When the EDTA-2Na concentration decreased to 0.5 mmol, the final products have no obvious change, unordered shapes, as shown in Figure 2S. Upon increasing to 2 mmol, no products can be obtained due to the increase in acidity, which is not conducive to the growth of MnOx. This is further proven as when keeping other conditions constant, no products can be obtained after adding double HNO_3 concentrations. The results indicate that EDTA-2Na concentration plays an important role in the formation of Mn_3O_4 nano-octahedrons.







Ref S1 P. Umek, A. Goter, M. pregelj, et al. *J. Phys. Chem. C*, 2009, **113**, 14798