Electronic Supplementary Material (ESI) for RSC Advances

Supplementary Information for

Supercritical N, N-Dimethylformamide for exfoliation and phase transition of layered manganese oxide materials to obtain trimanganese tetroxide nanosheets

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1. Some relative characterizations

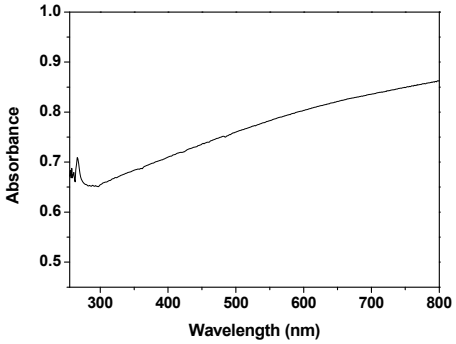

Fig. S1 UV-visible spectra of layered manganese oxides in the DMF solvent with a concentration of 0.25 mg mL^{-1}.

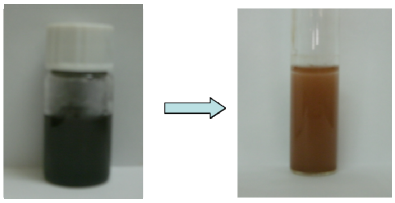

Fig. S2 Samples before (left) and after the SCF procedure (right).

2. Raman spectra

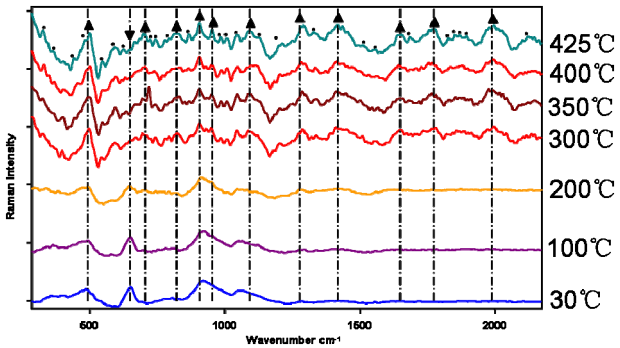

Fig. S3 *In situ* Raman spectra of the pre-intercalated bulk manganese oxides. The sample for *in situ* Raman was prepared with the mixture of layered manganese oxides and DMF in reactor increased to 200℃ for a pre-intercalation for considering the effect of intercalation [Y. K. Hsu et al., Chemical Communications, 2011, 47, 1252-1254&Z.-h. Liu et al., Langmuir 18, (2002) 4926-4932.] as much as possible, while the FTIR spectra of the samples with the temperature increased to 200℃, 300℃, and 400℃ in the main text of paper indicate this treatment has little intercalation of molecules. Noises from the fluctuations in the spectra may be resulted from some thermal effects and the H_2O produced in the transition or the combined H_3O^+ [Chem. Mater. 16, (2004) 5581-5588 & J. Mater. Chem. 9, (1999) 319-333.]. (Ambient pressure, increasing velocity: 10 ℃·min^{-1}, keeping time: 10min)

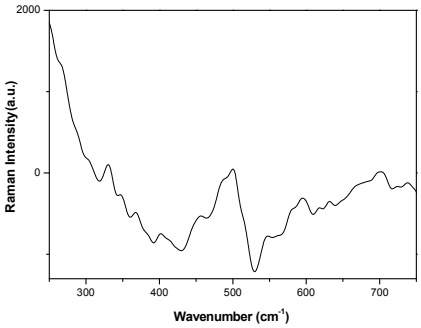

Fig. S4 Magnified *in situ* Raman spectra at 400℃ of Fig. S4.

3. Assembly for long time

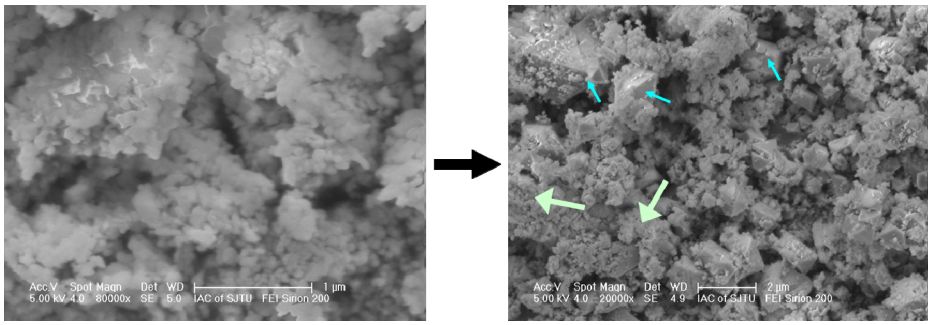

Fig. S5 Cracked nanosheet products in the exfoliating course (left) and the ones preserved in reactor for five more minutes (right).