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Facile Synthesis of Novel MnO_x Nano-structures and Their Catalytic Performance on CO Oxidation

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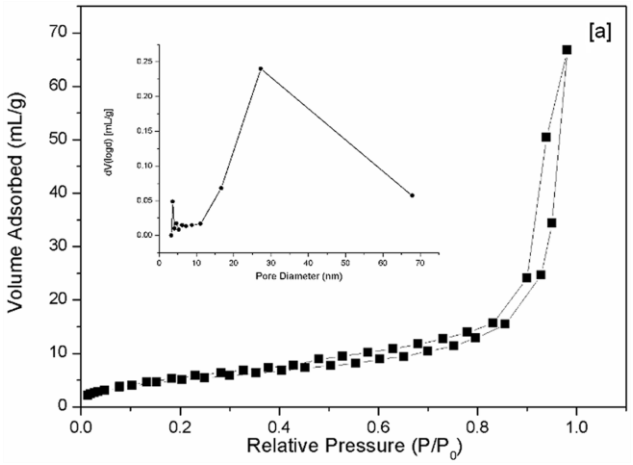

Fig. S1 N_2 adsorption-desorption isotherms of the Mn_3O_4 nanomaterials (S1) after calcination method; inset is the corresponding BJH pore size distribution curve.

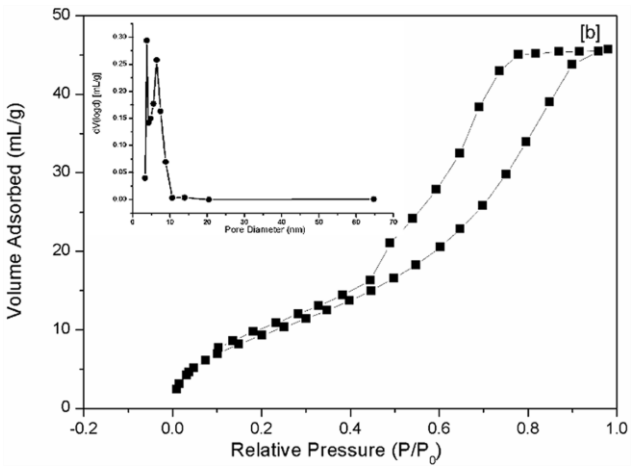

Fig. S2 N_2 adsorption-desorption isotherms of the Mn_3O_4 nano-ellipsoids (S2) after calcination method; inset is the corresponding BJH pore size distribution curve.

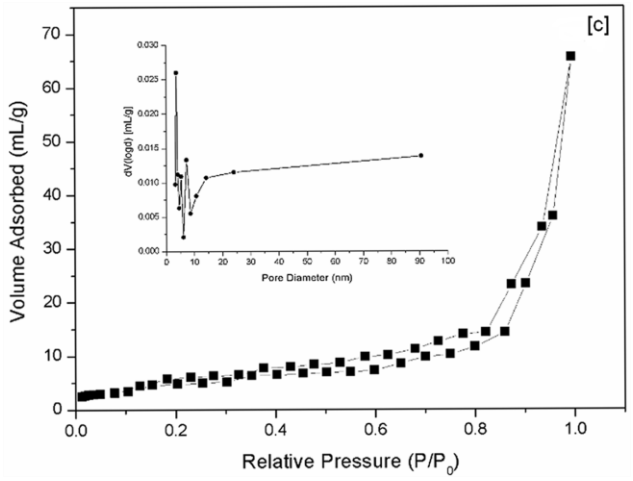

Fig. S3 N_2 adsorption-desorption isotherms of the Mn_2O_3 nano-flowers (S3) after calcination method; inset is the corresponding BJH pore size distribution curve.

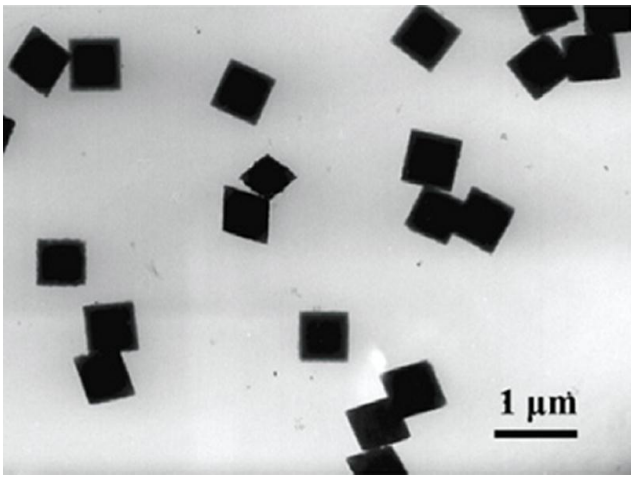

Fig. S4 Typical TEM images of Mn_2O_3 nano-octahedrons (S4).

Sample (Mn_2O_3 nano-octahedrons) preparation. All chemicals were of analytical grade and were used as-received without further purification. Monodispersed octahedral Mn_2O_3 nanoparticles were synthesized through a facile solvothermal route in the presence of PVP. In a typical experiment, 800 µl of $Mn(NO_3)_2$ solution (50 wt.%; 3.5 mmol) and 0.8 g of PVP (K-30) were dissolved in 18 ml of DMF under vigorous stirring. The solution was then turned into a Teflon-lined stainless steel autoclave of capacity 25 ml. The sealed tank was put into an oven and heated at 180°C for 24 h. After reaction, the autoclave was cooled to room temperature naturally. The black precipitates were collected by centrifugation, washed with deionized water and ethanol several times, and finally dried in air at 80°C for 12 h. The parameters affecting the morphology of the synthesized Mn_2O_3 nanostructures were also investigated under different experimental conditions.

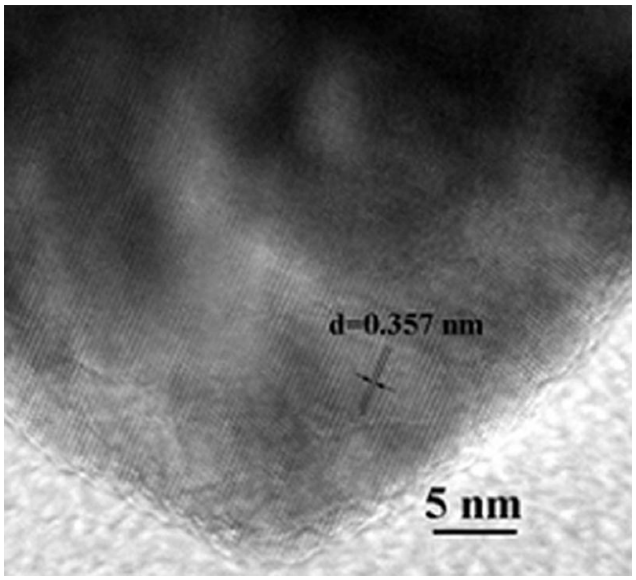

Fig. S5 HRTEM image of the Mn_2O_3 nano-octahedrons

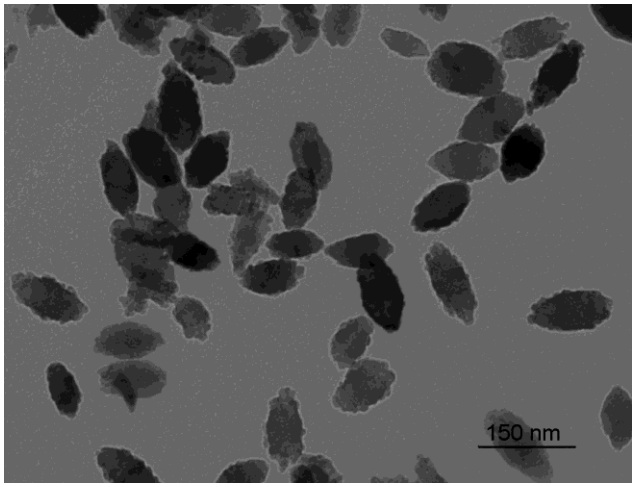

Fig. S6 Typical TEM images of Mn_3O_4 nano-ellipsoids (S2) after the catalysis.

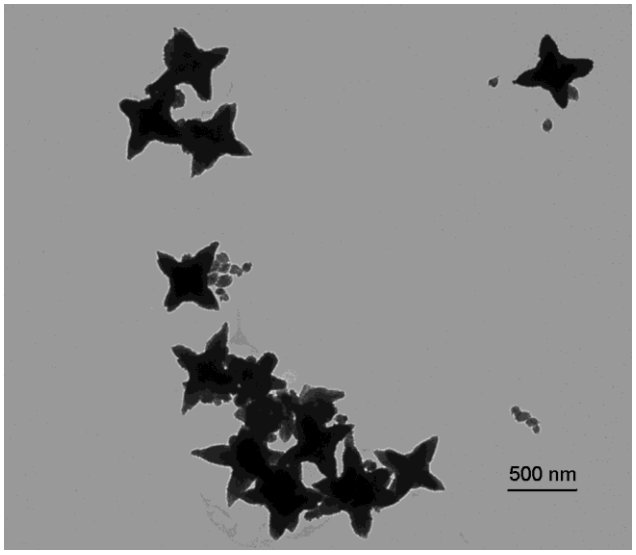

Fig. S7 Typical TEM images of Mn_2O_3 nano-flowers (S3) after the catalysis.