Electronic Supplementary Material (ESI) for RSC Advance

Controllable Hydrothermal-assisted Synthesis of Mesoporous Co_3O_4 Nanosheets

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We choose 300 °C as heat treatment temperature of hydrothermal products based on the TG and DSC curves and XRD results as shown in the following Fig. S1. These results (Fig. S1(a)) show that $Co(NH_3)_5(ONO)(NO_3)_2$ and $Co(CN)_2 \cdot H_2O$ hydrothermal products have already begin to decompose before 300 °C. After heat treatment at 300 °C for 3 h only Co_3O_4 was detected. And compared two XRD results (Fig S1b) of heat treatment products obtained at 300 °C and 450 °C, the intensities of Co_3O_4 diffraction peaks obviously became much strong when heat treatment was carried at 450 °C. These results clarified Co_3O_4 may be easy sintering deformation at higher temperature. Therefore, we choose 300 °C as heat treatment temperature for hydrothermal products in order to avoid destroying original nanosheet structure) at high temperatures in this study.

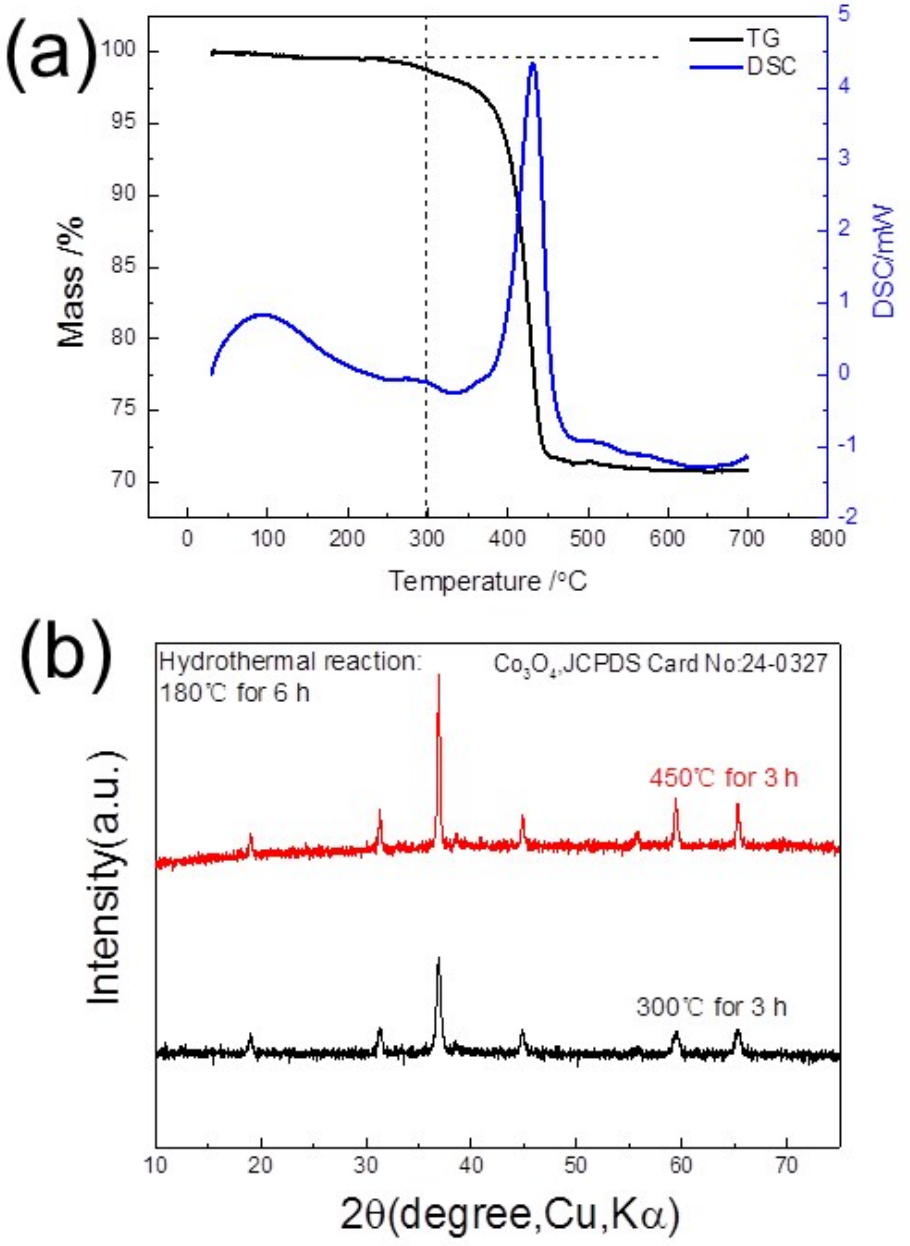

Fig. S1 (a) TG and DSC curves of the $Co(NH_3)_5(ONO)(NO_3)_2$ and $Co(CN)_2 \cdot H_2O$ hydrothermal products, and (b) X-ray diffraction pattern of heat treatment products.

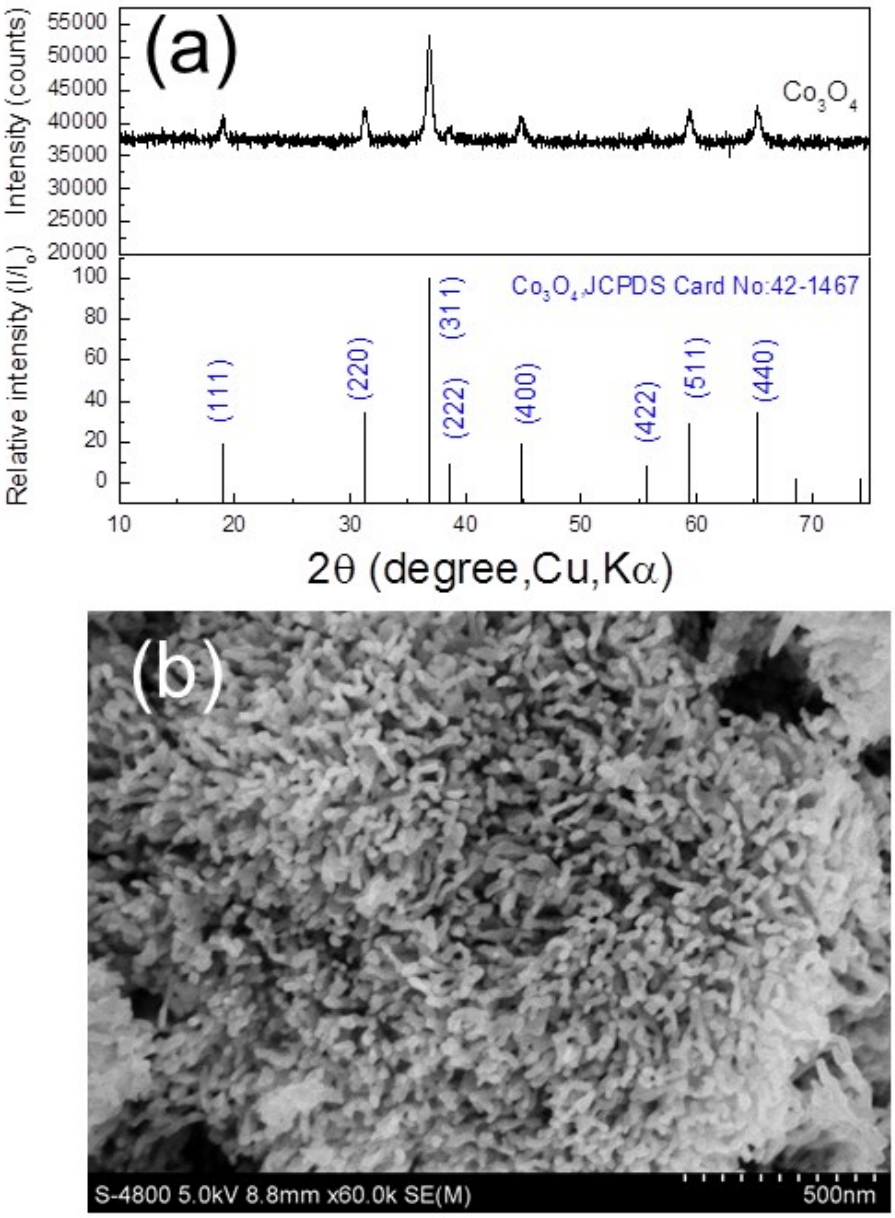

Fig. S2 X-ray diffraction pattern (a) and SEM image (b) of pompon-like Co_3O_4 synthesized by direct calcination of $Co(NO_3)_2 \cdot 6H_2O$ at 300 °C for 3 h in the air.

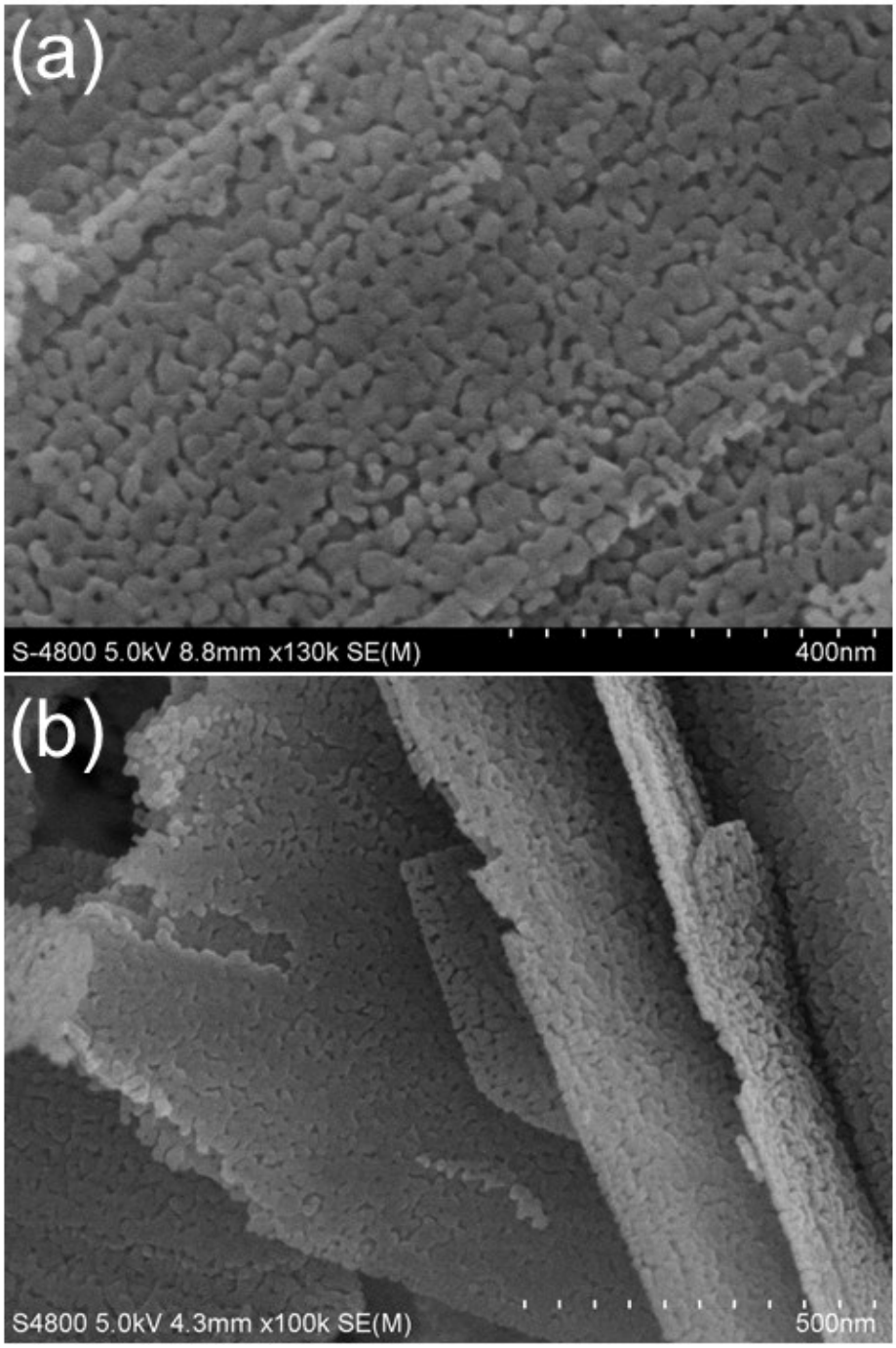

Fig. S3 SEM images of mesoporous Co_3O_4 nanosheets.

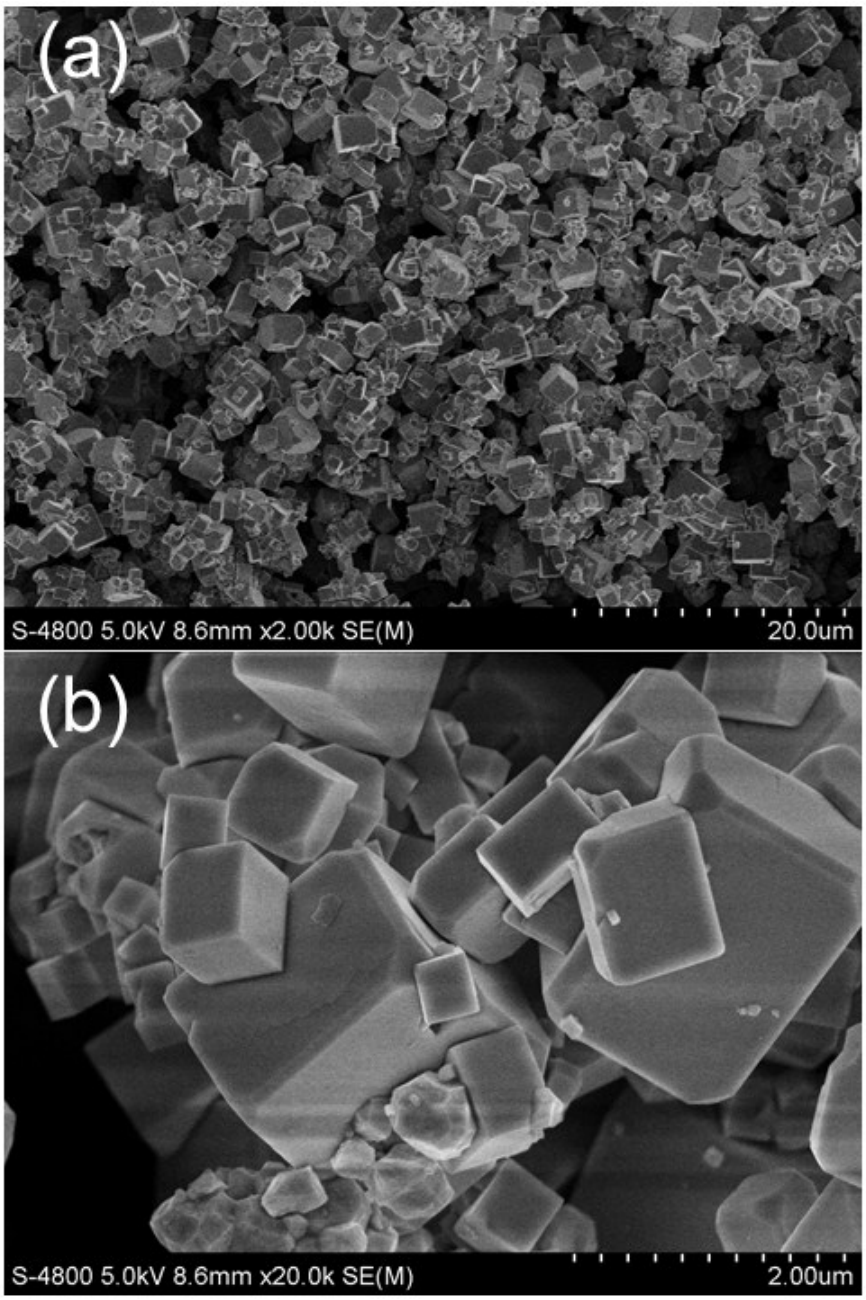

Fig. S4 SEM images of micro-size cube-shaped Co_3O_4 particles synthesized by hydrothermal method at 300 °C for 6 h.