Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting Information

Rapid microwave-assisted hydrothermal synthesis of CeO_2 octahedrons with mixed valence state and their catalytic activity for thermal decomposition of ammonium perchlorate

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Synthesis of CeO_2 cubes

0.868 g of $Ce(NO_3)_3 \cdot 6H_2O$ and 9.6 g of NaOH were dissolved in 5 and 35 mL of deionized water, respectively. Then, these two solutions were mixed in a Teflon bottle, and this mixture was kept stirring for 30 min with the formation of a milky slurry. Subsequently, the Teflon bottle was held in a stainless steel vessel autoclave. Finally, the autoclave was sealed and transferred into a electric oven, and was subjected to hydrothermal treatment at 180 °C for 24 h. After the hydrothermal treatment, fresh white precipitates were separated by centrifugation, washed with deionized water and ethanol several times, followed by drying at 60 °C in air overnight.

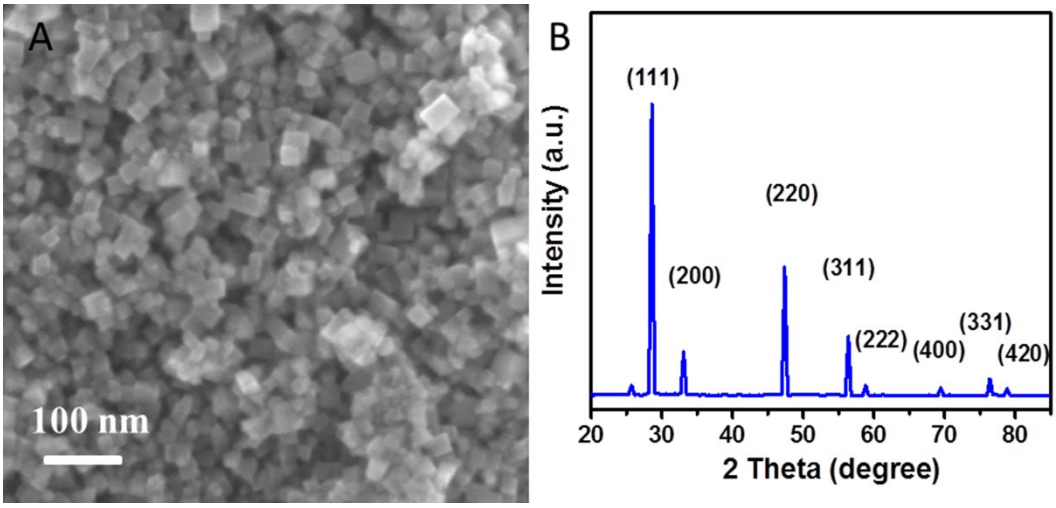

Fig. S1 SEM image (A) and XRD pattern (B) for CeO_2 cubes.

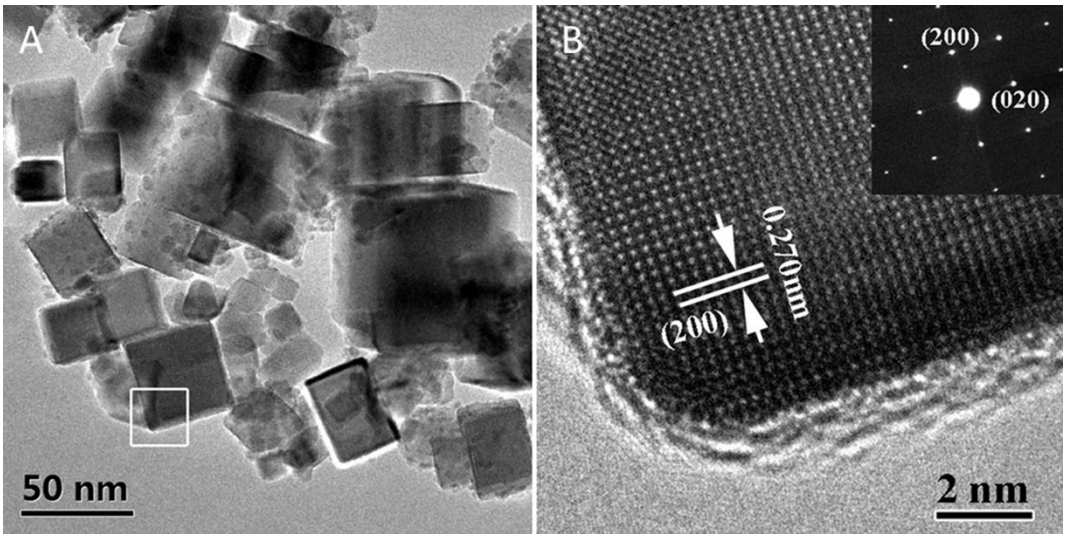

Fig. S2 TEM and HRTEM images of CeO_2 cubes: (A) the overview of typical cubes, (B) the HRTEM image of white regions in (A), inset is a fast Fourier transform (FTT) analysis.

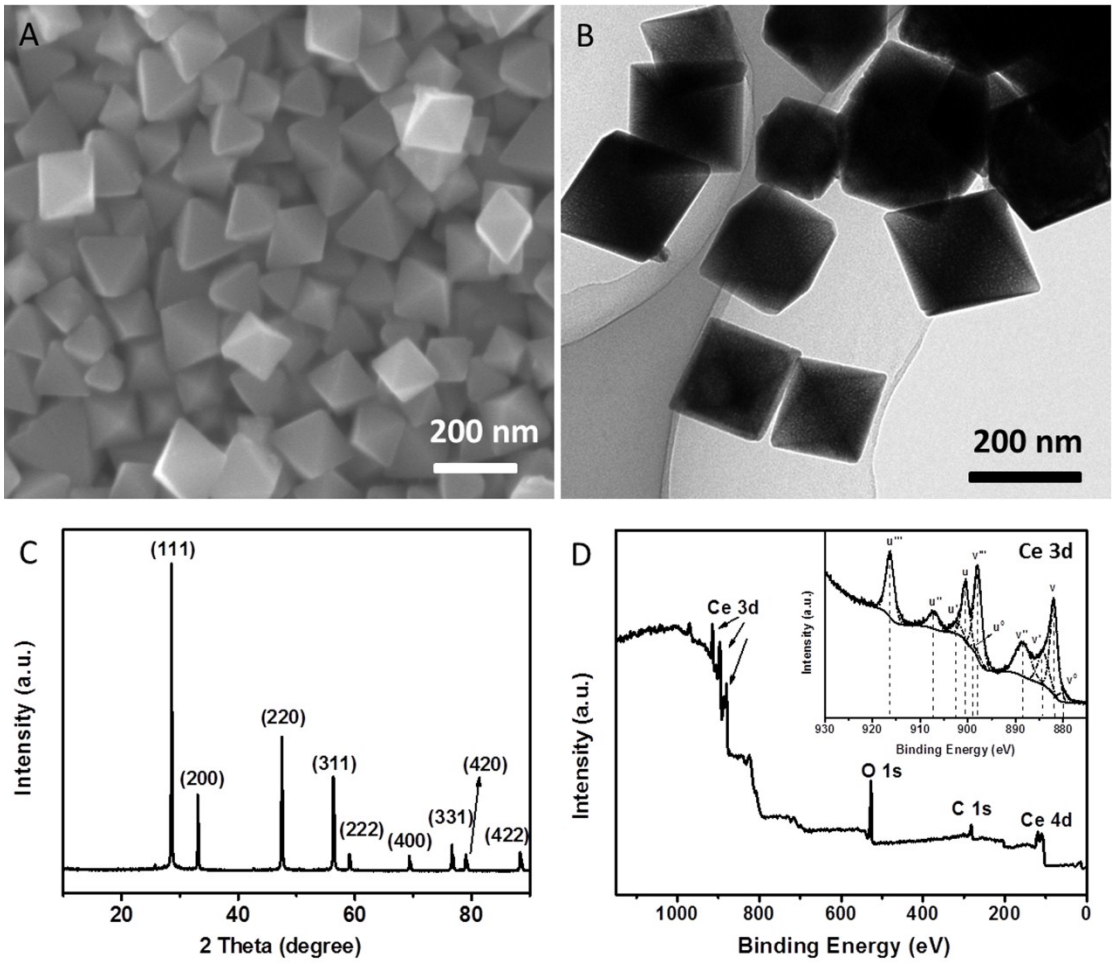

Fig. S3 (A) SEM and (B) TEM images, (C) XRD and (D) the survey XPS patterns of recovered CeO_2 catalyst, the inset in (D) is the multi peak separation patterns of Ce 3d.