Supporting information

Synthesis of Monodisperse CeO_2 Octahedra Assembled by Nano-sheets with exposed {001} facets and Catalytic property

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Experimental Section:

Synthesis of Monodisperse CeO_2 Octahedra Assembled by Nano-sheets:

In a typical synthesis, $Ce(NO_3)_3 \cdot 6H_2O$ (0.434 g, 1 mmol) and PVP (K-30, M=58000, 0.335 g, 0.006 mmol, $m_{Ce(NO3)3 \cdot 6H2O}/ m_{PVP}$= 1.300) were in order added to the mixed solvent of ethanol and distilled water (6 mL, v/v of 1:1). The mixed solvent placed in a beaker was put into ultrasonic cleaning machine (Frequency: 40 KHZ, Power: 50 W) for about 5 minutes. The purpose of treatment is fully mixed of the reactants. The resulting solution was transferred into a Teflon-lined stainless-steel autoclave and was kept at 200 ^oC for 12 h. The products were collected by centrifugation at 10000 rpm, and washed several times with deionized water and ethanol.

The composition and phase of the as-prepared products were acquired by the powder X-ray diffraction (XRD) pattern using a Panalytical X-pert diffractometer with CuKα radiation. The morphology and crystal structure of as-prepared products were observed by scanning electron microscopy (SEM, S4800), and high-resolution transmission electron microscopy (HRTEM, FEI Tecnai-F30) with an acceleration voltage of 300 kV. All TEM samples were prepared from depositing a drop of diluted suspensions in ethanol on a carbon film coated copper grid.

Measurement of catalytic CO oxidation. The catalytic activity of CeO_2 catalysts towards CO oxidation was carried out in a continuous flow reactor. The reaction gas, 10 mL/min 5% CO in nitrogen and 40 mL/min air, was fed to catalyst particles.

Steady-state catalytic activity was measured at each temperature with the reaction temperature rising from room temperature to 380 °C in step of 20 °C. The effluent gas was analyzed on-line by an on-stream gas chromatograph (FuLi 9790II) equipped with a TDX-01 column.

Table S1: The percentage of CO conversion to CO_2 at different reaction temperature

Reaction temperature (°C)	*140*	*160*	*180*	*200*	*220*	*240*	*260*	*280*	*300*	*320*	*340*	*360*	*380*
Conversion to CO_2 (%) (CeO_2 assemble by nanosheets)	*2.3*	*4.5*	*13.1*	*32.8*	*61.7*	*87.3*	*98.1*	*100*	*100*	*100*	*100*	*100*	*100*
Conversion to CO_2 (%) (CeO_2 assemble by nanoparticles)	*0*	*0*	*1.3*	*3.5*	*9.4*	*17.5*	*39.4*	*59.9*	*75.6*	*89.5*	*97.2*	*100*	*100*