

Electronic Supplementary Information
Highly catalytic activity of CuO nanorods for oxidation of
cyclohexene to 2-cyclohexene-1-one

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Experimental detail

All chemicals were of analytical grade and used as received. All water used in this study was deionized by a nanopure filtration system to a resistivity of 18 MΩ·cm.

In a typical synthetic procedure of CuO nanorods, 1.0g CuCl₂·2H₂O and 2.0g sodium citrate were dissolved in 30 mL deionized water. Following, a solution of NaOH (0.6g) in 2mL H₂O was added. The resulting solution was stirred continuously for about 30min until all solids were dissolved completely. The homogenous solution was transferred into the Teflon vessel of the hydrothermal bomb, which was then placed in the oven and maintained at 180 °C for 6h. Finally, the solution was cooled to room temperature spontaneously. The precipitates were separated by centrifuging and washed with distilled water and ethanol three times in turn. The resulting products were dried at 60 °C for 12h. The size of the product was tuned by varying the concentrations of sodium citrate. The morphology of all products was observed by Transition Electronic Microscopy (TEM: Tecnai-12, Philips, Netherland) and Field-Emission Scanning Electronic Microscopy (FE-SEM: Hitachi S-4800). X-ray powder diffractions (XRD) were performed on a D8 Advance (Super speed) X-Ray diffractometer (Brucker, Germany).

The oxidation of olefins by tert-bulyl-hydrogen peroxide (TBHP) was conducted in a round-bottom tri-neck flask equipped with a reflux condenser and a thermometer. In a typical process, 1mmol cyclohexene and 5mmol TBHP were mixed in 10mL acetonitrile. Then 10mg CuO catalyts were added to the above mixture solution. The reaction system was heated to 70°C and maintained at this temperature for 4h with continuously being stirred using a magnetic stirrer. At the end of each reaction, aliquots were taken and diluted to constant concentration. Gas chromatography-mass spectroscopy (GC-MS: Trace DSQ II, Thermo Com. USA) methods were used for identification and quantification.

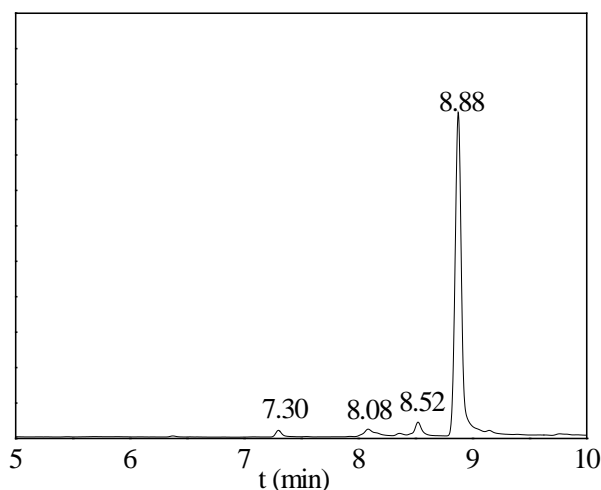
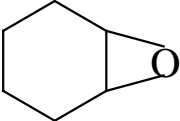
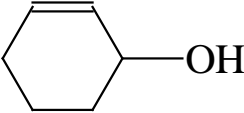
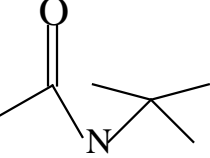
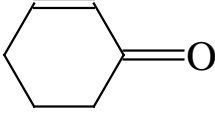


Figure S 1. The GC diagram of the oxidation system of cyclohexene.

Table S1. The structure and content of the products obtained from the reaction system according to Figure S1.

<i>t</i> (min)	% Area ^a	Structure
7.30	2	
8.08	3	
8.52		
8.88	95	

^a The reason for deleting the peak located at 8.52 min was that the correspondence compound structure is obviously not originated from the reaction between cyclohexene and TBHP.