

Fig. S1 Effects of pH values on the oxidation of ABTS (2 mM): A) ABTS alone; B) H₂O₂ (500 μM). The photos were taken on the 3rd minute after the addition of ABTS.

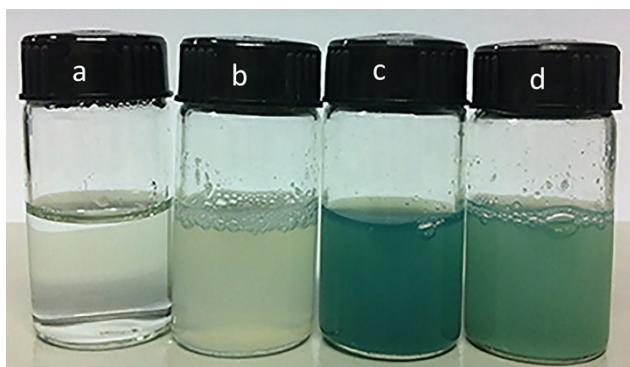


Fig. S2 Effect of catalase (CAT) on the oxidative activity of nanoceria: a) ABTS; b) CAT and ABTS; c) nanoceria and ABTS; d) pretreated nanoceria by CAT and ABTS. The photo was taken within 3 min after ABTS was added.

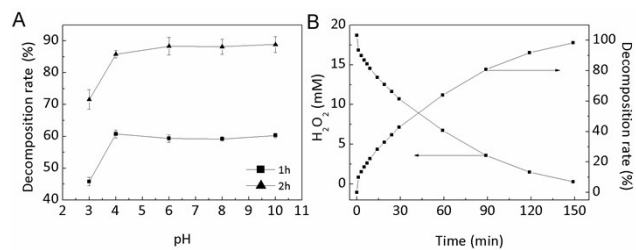


Fig. S3 The decomposition rate of H₂O₂ as a function of pH (A) and time (B) with H₂O₂ (19.0 mM) and nanoceria (1g L⁻¹) at 25±0.5°C and 200rpm.

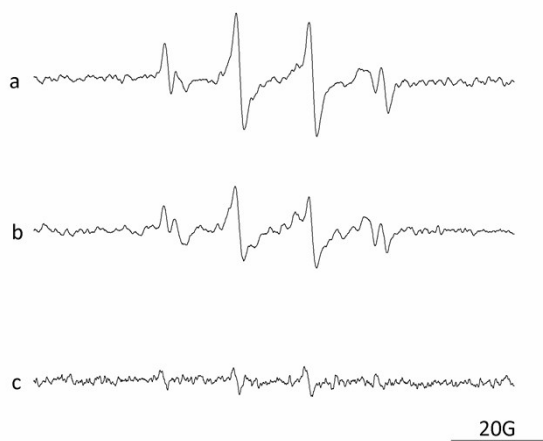


Fig. S4 EPR spectra: nanoceria (1g L^{-1}) with H_2O_2 (20 mM) at pH=3.0 (a) and pH=10.0 (b); c) H_2O_2 (20 mM), pH=3.0.

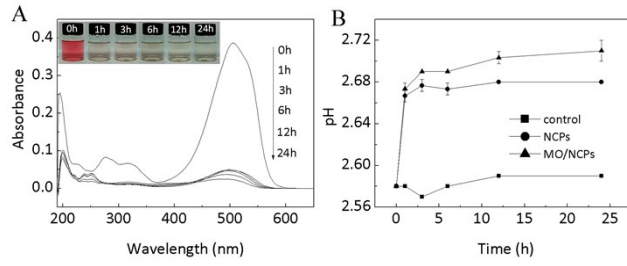


Fig. S5 A) UV-vis spectra of MO as a function of reaction time in the nanoceria (NCPs) suspension; B) pH values as a function of time, the control group was water at pH 2.58.

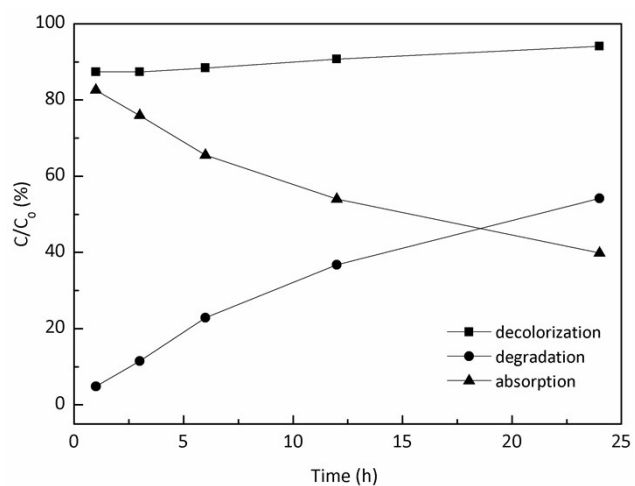


Fig. S6 Data analysis on the oxidation of MO catalysed by nanoceria: nanoceria (1g L^{-1}), MO (3.5 mg L^{-1}) with initial pH 2.58, $30\pm 0.5^\circ\text{C}$ and 200rpm.

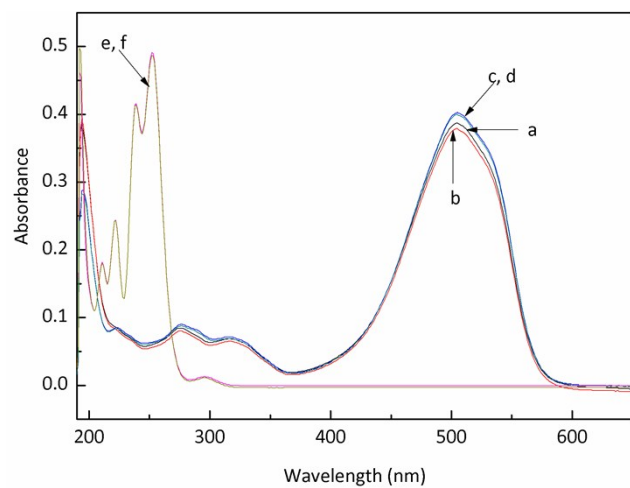


Fig. S7 The UV-vis spectra: supernatant (contained $18.9 \mu\text{M}$ dissolved Ce) of ceria/MO system with MO (3.5 mg L^{-1}) at the initial time point (a), and at 6 h (b); CeCl_3 ($18.9 \mu\text{M}$) / MO (3.5 mg L^{-1}) at the initial time point (c) and at 6 h (d); $668 \mu\text{M}$ CeCl_3 at the initial time point (e) and at 6 h (f). All the experimental conditions are pH 2.58, $30 \pm 0.5^\circ\text{C}$ and 200rpm.