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# Repeatable fluorescence switcher of $Eu^{3+}$-doped $CeO_2$ nanorods by L(+)-ascorbic acid and hydrogen peroxide

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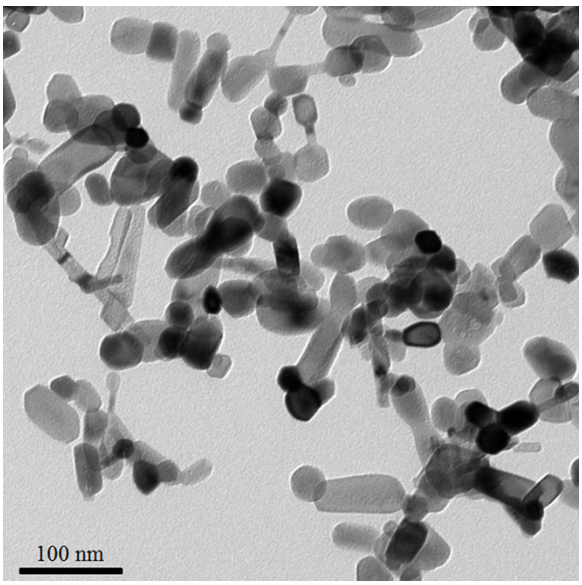


Fig. S1 TEM image of 1% $Eu^{3+}$-doped $CeO_2$ calcined at 900 °C in air for 2 hours.

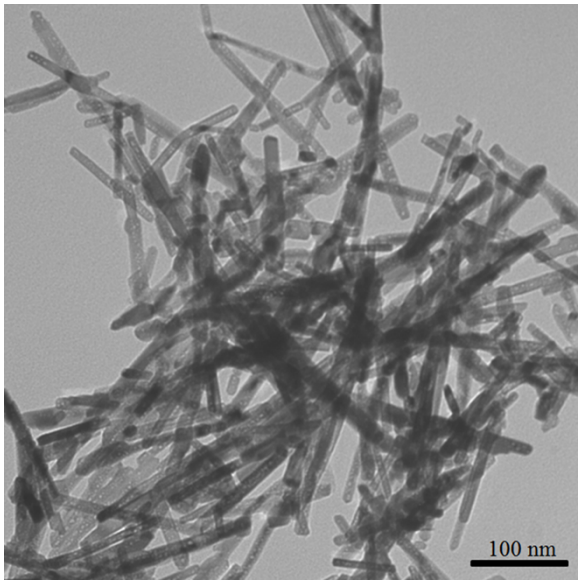


Fig. S2 TEM image of 1% $Eu^{3+}$-doped $CeO_2$ after treated by ascorbic acid and $H_2O_2$ (with the final concentrations of 2 mM and 1 mM, respectively) alternatively for 4 cycles.

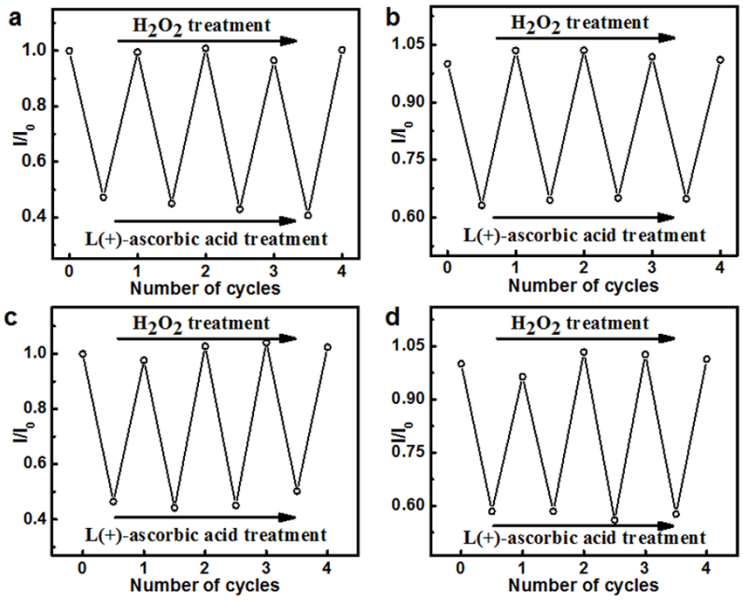


Fig. S3 The stability tests of (a) 0.5%, (b) 2.5%, (c) 5% and (d) 10% $Eu^{3+}$-doped $CeO_2$ treated by ascorbic acid with the final concentration of 2 mM and $H_2O_2$ with the final concentration of 1 mM alternatively for 4 cycles.