



Morphology and Size Controlled Synthesis of Mixed Valent Ceria Nanostructures

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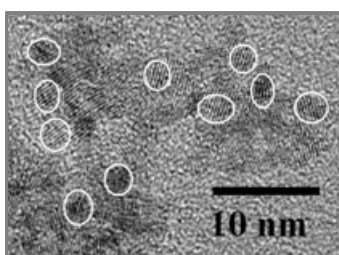
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ABSTRACT

We report a simple room temperature based aqueous route to synthesize nearly monodispersed ultra-small (~3 nm) ceria nanoparticles (NP). Ceria NPs were also synthesized by using NaOH assisted hydrothermal routes. Ceria NPs were also synthesized by using ethylenediamine and ethylene glycol as solvent. The results indicated the all the processes produced nearly monodispersed particles. Ethylene glycol assisted route produced smallest (~2.2 nm) particles whereas the room temperature-based process produced water dispersible particles. The ceria NPs possessed a mixed valence state and autocatalytic properties. Ce^{3+} percentage was found to maximum in the room temperature derived sample followed by ethylene glycol derived sample.

Graphical Abstract



Ceria nanoparticles.

Keywords: Ceria, Nanoparticles, Mixed Valency, Oxygen vacancy.
