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**NANOCERIA BASED THIN FILMS AS EFFICIENT HUMIDITY SENSORS**

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**Highlights**

- Ceria nanosystems of four different morphologies synthesized.
- Truncated octahedral particles exhibits excellent humidity sensing ability with response time; 10s and sensitivity; 99 %
- The humidity sensing efficiency depends on surface area and the amount of Ce<sup>4+</sup> present in the system

**Abstract**

Herein, we project the efficiency of cerium oxide nanostructures in humidity sensing. Truncated octahedral particles, rods, cubes and octahedral particles have been synthesized by adopting different synthesis routes to this effect. The obtained systems are well characterized by Fourier Transform Infrared spectroscopy (FTIR), X-Ray Diffraction (XRD) analysis, Electron microscopic analysis (SEM &TEM), Brunauer Emmet Teller (BET) surface area analysis, Raman spectroscopy and photoluminescence spectroscopy. The exponential decrease in the resistance of thin films of ceria nanostructures upon increase in relative humidity in the surroundings is investigated. The promising response of ceria nano systems towards humidity suggests their utility in environmental applications.

**Keywords:** ceria nanostructures; humidity sensing; response time; recovery time

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