

## عنوان مقاله:

Effect of Calcination Temperature on the Structural and Optical Properties of Zirconia Nanoparticles

## محل انتشار:

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## خلاصه مقاله:

Among advanced ceramics, zirconia is attracting increasing interest due to its excellent chemical resistance, good mechanical strength, high fracture toughness and hardness, high coefficient of thermal expansion, low thermal conductivity together with relatively high coefficient of thermal expansion, resistance to thermal shock, and wide band gap. In this work, zirconia nanoparticles with average particle size of 27 nm were prepared by a facile, rapid, and cost-effective microwave-assisted method using zirconyl nitrate as the starting material. The synthesized nanoparticles were calcined at temperatures ranging from 100 °C to 600 °C. The samples were characterized by X-ray powder diffraction, transmission electron microscope, and Ultraviolet-visible absorption spectroscopy. The band gap energy of zirconia samples was found to be 5.5 eV. The effect of calcination temperature on the structural and optical properties of zirconia nanoparticles was investigated as well. The results clearly showed the presence of purely monoclinic phase of zirconia when the calcination temperature exceeds 400 °C.

## کلمات کلیدی:

Zirconia, calcination, microwave-assisted method, band gap

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