Investigation of electrical and optical properties of calcium manganites prepared from solid state reaction & sol-gel

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Abstract: In this research, CaMnO₃ powders have been synthesized by solid state reaction and sol-gel methods at calcination temperature of 800°C. Particle size and morphology of the calcined powders have been investigated using XRD and TEM techniques. TEM image showed that the average particle size of the samples, prepared by sol-gel method, is about 85 nm. The optical gap was measured using the absorption spectrum of the powders. The value of the band gap was found for the sample synthesized by sol-gel method is about 3.46eV and that for sample prepared by solid solution to be about 3.40eV. Also the phase formation of the powders has been studied by Fourier transform infrared (FTIR) spectroscopy. Resistivity measurements of the samples between 300-550°C revealed that resistivity of the samples decreases with increasing temperature.

Keywords: solid state reaction; sol-gel; perovskite; CaMnO₃.

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