

Synthesis, Characterization and Gas Sensing Applications of Perovskite CaZrO₃ Nanoparticles

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Abstract : Calcium Zirconate (CaZrO₃) has high protonic conductivities at elevated temperature in water or hydrogen atmosphere. Undoped calcium zirconate acts as a p-type semiconductor in air. In this paper, we reported synthesis of CaZrO₃ nanoparticles via modified molecular precursor method. The precursor calcium zirconium oxalate (CZO) was synthesized by exchange reaction between freshly generated aqueous solution of sodium zirconyl oxalate and calcium acetate at room temperature. The controlled pyrolysis of CZO in air at 700°C for one hour resulted in the formation nanocrystalline CaZrO₃ powder. CaZrO₃ obtained by the present method was characterized by Simultaneous thermogravimetry and differential thermogravimetry (TG-DTA), X-ray diffraction (XRD), infra-red spectroscopy and transmission electron microscopy (TEM). The pellets of synthesized CaZrO₃ fabricated, sintered at 1000°C for 5 hr and tested as sensors for NO₂ and NH₃ gases.

Keywords : CaZrO₃, CZO, NO₂, NH₃

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