

Structural Characterization And Optical Properties Of NiTiO₃ Powders Prepared By Polymeric Precursor Method

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Powders of ilmenite nickel titanate (NiTiO₃) were prepared by the polymeric precursor method based on a modified Pechini process at a relatively lower temperature. This method allows smaller grains, larger specific surface area, and narrow particle size distribution. In this study, titanium(IV) n-butoxide, and nickel acetate were separately dissolved in ethanol, and added to citric acid(CA)-ethanol solution at room temperature. The mixture, with a molar ratio Ni/Ti/CA=1/1/1, was heated at 70°C for several hours until the agglomerate precursor formed. X-ray diffraction (XRD) indicated that pure NiTiO₃ phase was synthesized via Ni-Ti-TA powder precursor calcinated from 600-900°C for 3 hours, and scanning electron microscopy (SEM) shows grain size of nickel titanate powders at 600°C was estimated about 50nm. The structural characterization and optical properties were investigated by DTA/TG, TEM, XPS and diffuse reflectance UV-visible spectroscopy.

