

Conventional Synthesis and Characterization of Zirconium Molybdate, $\text{Nd}_2\text{Zr}_3(\text{MoO}_4)_9$

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Abstract : Rare earths containing complex metal oxides have drawn much attention due to physical, chemical and optical properties which make them feasible in so many areas such as non-linear optical materials and ion exchanger. We have researched a systematic study to obtain rare earth containing zirconium molybdate compound, characterization, investigation of crystal system and calculation of unit cell parameters. After a successful synthesis of $\text{Nd}_2\text{Zr}_3(\text{MoO}_4)_9$ which is a member of rare earth metal containing complex oxides family, X-ray diffraction (XRD), High Score Plus/Rietveld refinement analysis, and Fourier Transform Infrared Spectroscopy (FTIR) were completed to determine the crystal structure. Morphological properties and elemental composition were determined by scanning electron microscopy (SEM) and energy dispersive X-ray (EDX) analysis. Thermal properties were observed via Thermogravimetric-differential thermal analysis (TG/DTA).

Keywords : $\text{Nd}_2\text{Zr}_3(\text{MoO}_4)_9$, powder x-ray diffraction, solid state synthesis, zirconium molybdates

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