

Structural, Optical, And Ferroelectric Properties Of BaTiO₃ Sintered At Different Temperatures

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Abstract : In this work, we have synthesized BaTiO₃ via sol gel method by sintering at different temperatures (600-1000 °C) and studied their structural, optical and ferroelectric properties through X-Ray diffraction (XRD), UV-Vis spectrophotometer and PE Loop Tracer. X-Ray diffraction patterns of barium titanate samples show that the peaks of the diffractogram are successfully indexed with the tetragonal structure of BaTiO₃ along with some minor impurities of BaCO₃. The optical band gap calculated through UV Visible spectrophotometer varies from 4.37 to 3.80 eV for the samples sintered at 600 to 1000 °C, respectively. The particle size calculated through transmission electron microscopy varies from 20 to 60 nm for the samples sintered at 600 to 1000 °C, respectively. Moreover, it has been observed that the ferroelectricity reduces as we increase the sintering temperature.

Keywords : nanostructures, ferroelectricity, sol-gel method, diffractogram

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