Fabrication and investigation of structural and Optical Properties of Bismuth Titanate (Bi$_4$Ti$_3$O$_{12}$) Thin Films by sol-gel method

S. Ranjbar*, M. Rezaee roknabadi, M. Behdani

Department of Physics, Faculty of Sciences, Ferdowsi University of Mashhad

(Received: 10/5/2016, in revised form: 8/9/2016)

Abstract: Bismuth titanate (Bi$_4$Ti$_3$O$_{12}$) ceramic have attracted many attentions due to their various significant properties and applications and have been studied by many researchers. In this study, the related solutions were prepared by using sol-gel technique, and coated on glass substrates, using the spin coating instrument. Then, the structural and optical properties of the prepared thin films were investigated. In more details, at first the primary cell was prepared using bismuth nitrate, acetic acid, titanium isopropoxide, 2-methoxyethanol and acetylene aceton with certain molar ratios. After mixing and stirring the ingredients, the sol-gels were formed. Then they were coated on glass substrates with a specific speed, using spin coating instrument. Also in this study, we investigate the structural and optical properties of Bismuth Titanate (Bi$_4$Ti$_3$O$_{12}$) thin films. In orde to determine the type of phases, surface morphology and optical properties of the prepared thin films, the X-ray diffraction patterns, scanning electron microscopy (SEM) and optical absorption-transmission spectra analysis of Sun and Pole were used, respectively.

Keywords: Sol-gel; bismuth titanate; thin film; spin coating.

*Corresponding author, Tel:09353371955, Email: sina.ranjbar70911@gmail.com