

Microstructural, Dielectric and Optical Properties of [KNbO₃]_{0.9} – [BaNi_{0.5}Nb_{0.5}O₃]_{0.1} Perovskite Ceramics

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In this work, [KNbO₃]_{0.9} – [BaNi_{0.5}Nb_{0.5}O₃]_{0.1} (KBNNO) perovskite ceramics are synthesized under various conditions by using the solid-state combustion technique. Their microstructural, Raman, dielectric, optical, and photovoltaic properties are investigated. X-ray diffraction spectroscopy reveals that the synthesized ceramics have a cubic structure. A high purity KBNNO sample is obtained at the sintering temperature of 1100C with the dwell time of 3 h. Raman spectroscopy of these ceramics shows a broadening of vibrational peaks for the sample sintered at 1130C, which implies an existence of impurity phases. The dielectric constant of 3000 at room temperature is obtained. The optical absorption of light in visible range as well as the photovoltaic response are observed in this ceramic. This work demonstrates the potential usages of KBNNO in electrical and opto-electronic applications.

Primary authors: Dr SRIPHAN, Saichon (King Mongkut's Institute of Technology Ladkrabang); Dr VIT-TAYAKORN, Naratip (King Mongkut's Institute of Technology Ladkrabang); Dr KIRAVITTAYA, Suwit (Naresuan University); Dr BONGKARN, Theerachai (Naresuan University)

Presenter: Dr SRIPHAN, Saichon (King Mongkut's Institute of Technology Ladkrabang)

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