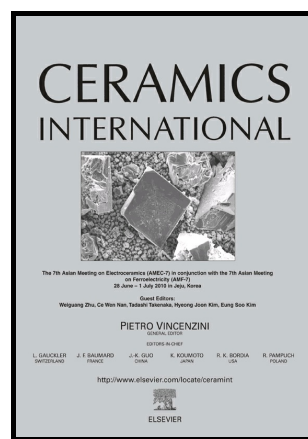


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Crystal Structure, Phonon Modes and Dielectric Properties of B Site Ordered ABiLiTeO₆ (A = Ba, Sr) Double Perovskites

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Abstract

ABiLiTeO₆ (A = Ba, Sr) double perovskite oxides were synthesised through conventional solid - state ceramic route. X-Ray diffraction patterns indicated pseudocubic symmetry for both compounds. Deconvoluted Raman spectra using Lorentzian function gave 7 first order Raman modes for both BaBiLiTeO₆ and SrBiLiTeO₆ whereas Infrared spectroscopy gave 8 modes for BaBiLiTeO₆ and 9 modes for SrBiLiTeO₆. Observed phonon modes were in good agreement with the corresponding group theoretical predictions for space group *I4/m* for both compounds. Rietveld refinement of the XRD patterns also confirmed *I4/m* space group for ABiLiTeO₆ (A = Ba, Sr) with 1:1 B site ordering of Te⁶⁺ and Li⁺ cations. The random occupancy of Ba²⁺ and Bi³⁺ at the A site in BaBiLiTeO₆ whereas Sr²⁺ and Bi³⁺ in SrBiLiTeO₆ were revealed from Rietveld refinement. Microstructure of both the compounds gave average grain size of less than 3 μm . At 1 MHz, BaBiLiTeO₆ and SrBiLiTeO₆ possess porosity corrected dielectric constants of 49.5 and 34.4 and dielectric losses of 0.029 and 0.028 respectively.

Keywords: Double Perovskite, Cation Ordering, Raman Spectra, Dielectric properties.

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