Structural and magnetic properties of Calcium and Lanthanum substituted Bismuth Ferrite.

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**Abstract**. Polycrystalline materials having compositions Bi0.8A0.2FeO3 (A = Ca, La) were synthesized by the conventional solid state reaction method . Powder X-ray diffraction performed at room temperature show that all samples are in single phase. Rietveld refinement presented a good agreement between the observed and calculated patterns. Refinement also revealed no change in crystal structure on 20% substitution of Ca, La at Bi site. All the samples crystallized in rhombohedral structure with space group R3c as of parent BiFeO3 [1]. Substitution at Bi site reduced the formation of secondary phases (Bi2Fe4O9 and Bi25FeO40) and no traces of La2O3 and CaCO3 have been found up to 20 % substitution. Substitution of La at A-site enhances stability in comparison to Ca as evident from Goldschmidt tolerance factor [2]. Enhancement in magnetic properties is observed with substitution which is due to canting of the antiferromagnetically ordered spins by a partial structural distortion [3].

References:

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