Structure Evolution and Magnetoelectricty in BaO-TiO-FeO-CoO System at R .T

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Crystal structures evolution and their transformation with compositions have been studied on BaO-TiO-FeO-CoO system over a composition zone using Rietveld analysis of x-ray powder diffraction data .The phases as appeared after synthesis showed at RT, a combination of perovskite and spinel phases corresponding to piezoelectric [PE] and piezomagnetic [PM]phases as grown in situ leading to a composite magnetoelectric [ME] material. The ME property of such composites at RT have been measured by dynamic method. A quantitative comprehension of the ME property of the composite in terms of the structures of the component phases have established that ME property being the result of mechanical coupling between the PE and PM phases has considerable contribution from their individual structural property which have been evoluted during in-situ preparation.

Keywords: x-ray structural crystallography, magnetoelectri c property, composite inorganic phases