

$\text{Bi}_{0.5}\text{Pb}_{0.5}\text{Fe}_{0.5}\text{Zr}_{0.5}\text{O}_3$

This compound crystallizes in orthorhombic space group $Pb_{21}m$ with $a \approx \sqrt{2}a_p$, $b \approx 2\sqrt{2}a_p$ and $c \approx 2a_p$ (with $a_p \approx 4.04$ Å), and exhibits antiferromagnetic order below 450 K. The refinement of the magnetic structure at 10 K shows that the Fe^{+3} ions order with a propagation vector $k = (0,0,0)$ and a magnetic moment of $4.1(1) \mu_B$.

 $\text{Ba}_2\text{CoTeO}_6$

It was found that at 295K the perovskite crystal structure is trigonal, space group $P-3m$, and contains a completely ordered array of the CoO_6 and TeO_6 octahedra. When the temperature is decreased, this compound undergoes an AFM phase transition below 20K and magnetic diffraction peaks were observed. These new peaks are forbidden for crystallographic Bragg reflections in the space group $P-3m$. The antiferromagnetic structure at 10K was characterized by a propagation vector of $k = (1/2, 1/2, 0)$; this structure shows an ordered magnetic moment of $2.4(1) \mu_B$ for the Co^{2+} ions.

 $\text{Pb}_2\text{CoTeO}_6$

At room temperature this complex perovskite can be described as a hexagonally distorted perovskite structure ($a=5.676(1)$, $c=13.852(1)$ Å *s.g.* $P6_3/mmc$). Above the ferroelectric phase transition ($T_c=380\text{K}$) the structure was found as a cubic ($a=8.032(1)$ Å, *s.g.* $Fm-3m$)

Below the antiferroelectric phase transition at 200K the best fit was obtained for a monoclinic structure (space group $P2_1/n$, $a=5.663(1)$, $b=5.680(1)$, $c=8.019(1)$ Å, $\beta=90.19(1)^\circ$ and considering a site disorder of cations Co/Te. With decreasing temperature this compound undergoes an antiferromagnetic phase transition phase near 25K and several magnetic reflections were registered. The antiferromagnetic structure at 5K was characterized by a propagation vector of $k = (1/2, 0, 1/2)$ and an ordered magnetic moment of $2.5(3) \mu_B$ for the Co^{2+} cations.

Keywords: magnetoelectric; neutrons; perovskite

FA2-MS05-P13**Synthesis of a New Compound Based on Tin (II) with Intermediate SnX_4E and SnX_5E Geometry.**

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Hybrid compounds based on tin (II) are very rare, i.e. there are only two structures reported in literature with a general formula hydrazinium(2+) [trifluorostannate(II)] [3]. Recently, two other structures including SnF_3^- has been synthesized and structurally determined [1], [2]. This work deals with the first hybrid of tin (II) where tin atom take up the SnX_4E geometry. The crystal structure of $\text{C}_{12}\text{H}_{14}\text{N}_2^{2+}$, $(\text{Sn}_2\text{F}_6)^{2-}$ was determined using X-ray single-crystal diffraction. Characterizations with Mössbauer spectroscopy and electric conductivity will be given. The title compound is built up SnF_3^- anions and 1,1'-biphenyl-4,4'-diamonium, diprotonated organic ring. hydrogen bonds of N-H...F and N-H...O ensure the cohesion of the hydride structure .

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