[1] S.M. Peiris, G. I. Pangilinan, T. P. Russell, E. F. Westrum, Jr. and B. H. Justice, *J. Phys. Chem. A*. 2000, 104, 1118.
[2] T. P. Russell, G. J. Piermarini, S. Block and P. J. Miller, *J. Phys. Chem*., 1996, 100, 3248.
[3] P.J. Miller, S. Block and G. J. Piermarini, *Combust. Flame,* 1991, 83, 174.
[4] N. Goto, H. Fujihisa, H. Yamawaki, K. Wakabayashi, Y. Nakayama, M. Yoshida and M. Koshi, *J. Phys. Chem. B*., 2006, 110, 23655.

MS17 O5

Magnetic and crystal structure of the $BiCrO_3$ multiferroic compound. Pierre Bordet[a], Céline Darie[a], Céline Goujon[a], Maria Bacia[a], Holger Klein[a] and Emmanuelle Suard[b], [a] *Institut Néel, CNRS-UJF, BP166, 38042 Grenoble cedex 9, France,* [b] *Institut Laue-Langevin, BP156, 38042 Grenoble cedex 9, France*
E-mail: pierre.bordet@grenoble.cnrs.fr

Keywords: multiferroics, perovskite, neutron diffraction

Bi-based perovskites are the subject of a renewed research interest due to the coexistence of magnetic and electric orders observed in $BiMnO_3$ and $BiFeO_3$. This rare phenomenon is thought to originate from the structural distortion induced by the $6s^2$ electron lone pairs of the Bi^{3+} cations. Another consequence is the instability of many of these compounds at room pressure. We report here the synthesis at high pressure and the crystallographic/magnetic investigation of $BiCrO_3$, an up-to-now less studied material [1], using electron microscopy and temperature dependent x-ray and neutron powder diffraction.

Polycrystalline samples of $BiCrO_3$ were synthesized by high pressure solid state reaction in a Conac anvil-type apparatus at 2 GPa and 750°C. Magnetic susceptibility measurements show the onset of magnetic order at 114K followed by a large increase below 80K. X-ray powder diffraction measurements were carried out up to 900°C under inert gas or air. Neutron powder diffractograms were collected on the D20 and D2B instruments of the ILL-Grenoble between 2K and 470K. $BiCrO_3$ is found to be isostructural to $BiMnO_3$ at room temperature, with monoclinic space group C2, and 3 independent Cr^{3+} cation sites. It transforms to the orthorhombic GdFeO3 type at 405K. Although the observed magnetic neutron scattering is confined to the nuclear Bragg peaks, solution and refinement of the neutron diffraction data indicate the appearance of G-type anti-ferromagnetic order at the 114 K transition temperature, with all spins aligned along one of the unit cell axes, spins on different Cr sites being anti-parallel. This is followed by a progressive spin re-orientation between 80 K and 60 K. The low temperature value of the magnetic moment is 2.5 μB as expected for Cr^{3+} cations. Detailed results of these investigations and comparison with dielectric measurements will be presented at the meeting.

[1] Niitaka S. Et al.., Solid State Ionics 172 (2004) 557–559