**W0057**

**Structural and Magnetic Characterization of the Perovskite Type 112 Compounds, $\mathbf{REBaCuCoO_{5+\delta}}$ (RE = rare earths and Y).** Leopoldo Suescun[1], Alvaro W. Mombrú[1], Camille Y. Jones[2], Brian H. Toby[2], Claudio Cardoso[3], Fernando M. Araújo-Moreira[3], [1]CSSC-Lab/Dequifim, Facultad de Química, U. de la República Montevideo, Uruguay, [2]Crystallography Group, NIST Center for Neutron Research, Gaithesburg, MD, USA, [3]Dept. de Física, UFSCar, São Carlos, SP, Brazil.

The structure and magnetism of the $REBaCuCoO_{5+\delta}$ compounds with RE = Y, Pr, Nd, Sm, Eu, Dy, Er and Tm as determined by synchrotron X rays and neutron powder diffraction and susceptibility measurements will be presented. All the studied compounds appear to be isostructural and were refined in the typical 112 perovskite type tetragonal space group P4/mmm. Both Cu and Co occupy different positions in the cell displaying Cu-O and Co-O bond distances consistent with elongated $CuO_5$ and more symmetric $CoO_5$ pyramids. The amount of nonstoichiometric oxygen (δ) present in the structure displays a monotonic growth when the $RE^{3+}$ ionic radii increases. This implies that the mean oxidation state of the Cu/Co sites grow from 2.5 (δ = 0) to 3 (δ = 0.5) affecting the arrangement and modulus of the magnetic moments of both magnetic atoms. Antiferromagnetic ordering below the Néel temperature that was estimated to lie between 400 and 600 K has been observed for all of them. The magnetic structure of the compounds with RE = Y, Dy, Er and Tm could be described by the bicolour I4'/m'm'm space group with $\mathbf{a}_M = \sqrt{2}\mathbf{a}$ y $\mathbf{c}_M = 2\mathbf{c}$. The high nonstoichiometric oxygen content ($\delta \approx 0.5$) implies the presence of Cu(III) in the compounds with RE = Pr and Nd. This is associated with a change in the magnetic structure of these compounds being described in the bicolour I4'm'm space group with $\mathbf{a}_M = \sqrt{2}\mathbf{a}$ y $\mathbf{c}_M = \mathbf{c}$.