Double Perovskites have been object of a deeper study in the last years, due to the potential properties as magnetoresistance, multiferroics, catalysis and materials for SOFC applications [1]. This new double perovskite family was synthesized in air by ceramic method for 24 hs at 1420°C for Mn compound and 1300°C for Ni and Co compounds. The Mn and Co perovskites were obtained with high degree of purity, with ≈ 2% of LaMnO3 and 1% of La2O3 as impurities, respectively. The crystal structure was refined by Rietveld Analysis from X-Ray Powder Diffraction data (XRPD). All double perovskites crystallize with P 21/n monoclinic space group, with a-b-c+ tilt system [2] and high average tilting angle (15.85°, 15.81° and 15.82° for Mn, Co and Ni compounds, respectively). The B2+ and Sb5+ cations are distributed with highly order degree in the Wyckoff sites 2c and 2d. These highly ordered perovskites show superstructure peaks in around 18° - 20° in 2θ.

Magnetometry measurements were currently made for Mn compounds, showing interesting features in M vs T curves which are highly dependent of magnetic applied field. The Curie-Weiss fitting was realized at high range of temperature (paramagnetic zone) and positive values of θw (weiss temperature) was obtained for different magnetic applied fields. These positive values are indicative of predominant ferromagnetic interactions in the system. Also, M vs H curves show a linear behavior at high magnetic field and open loops are shown for low magnetic field for temperatures below ≈100 K. All these characteristics point to a complex magnetic behavior and the ferromagnetic contribution is due to nanoclusters of Mn-O-Mn due to antisite disorder with high values of μeff per cluster.

Structural characterization through XRPD data, M vs Temperature, M vs Magnetic Field and High-resolution Kβ X-ray emission spectroscopy, will be presented in this work.