

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Double perovskites nanoparticles: synthesis and magnetic properties ( $\text{La}_2\text{NiMnO}_6$  vs  $\text{La}_2\text{CoMnO}_6$ )** YUANBING MAO, University of Texas-Pan American — Nanoparticles of double perovskite  $\text{La}_2\text{BMnO}_6$  ( $B = \text{Ni}$  and  $\text{Co}$ ) with average particle size of about 50 nm were successfully prepared using a facile, environmentally friendly, scalable molten-salt synthesis method at 700 °C in air. Their structural and morphological properties were characterized by X-ray diffraction and transmission electron microscopy. Their magnetic properties were evaluated using dc magnetic  $M$ - $T$  and  $M$ - $H$ , and ac magnetic susceptibility versus frequency, temperature, and field for the first time. The magnetic properties of these double perovskite nanoparticles indicate that they possess very different magnetic behaviors. The following results will be discussed: (i) field-cooled and zero-field-cooled magnetization curves become divergent at their Curie temperature, i.e. 275 K and 210 K for  $\text{La}_2\text{NiMnO}_6$  (LNMO) and  $\text{La}_2\text{CoMnO}_6$  (LCMO) nanoparticles, respectively, which are almost unchanged from their bulk and thin film counterparts. (ii) ac susceptibility indicates that the LNMO particles are much more complex structurally and may have anti-site defects or a second-phase with a different transition temperature. For a better understanding of the nature of the magnetic state and dynamic characteristics observed here for these LNMO and LCMO nanoparticles, further detailed studies are needed.

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Date submitted: 12 Nov 2014

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