

Abstract Submitted  
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**Structural and magnetic ordering in bulk Sr<sub>2</sub>FeMoO<sub>6</sub> synthesized by planetary ball mill: The effects of grinding.**<sup>1</sup> J.M. LUCY, A.J. HAUSER, B. PETERS, F.Y. YANG, The Ohio State University — The standard solid-state synthesis procedure has been widely used to make bulk complex oxides, including half-metallic double perovskite Sr<sub>2</sub>FeMoO<sub>6</sub>. However, although it is generally recognized that multi-step grinding and heating are crucial for synthesis of high quality materials, little has been done to quantitatively characterize the effect of grinding on the quality of the final products. We systematically varied the level of grinding, ranging from poor grinding by hand for a short period of time (~10 min) to very fine grinding and mixing by a planetary ball mill for many hours which produces uniform sub-micron particles. XRD, SEM and VSM were used to characterize the structural and magnetic properties. The Sr<sub>2</sub>FeMoO<sub>6</sub> samples made by different grinding methods exhibit drastically different structural and magnetic ordering. The highest quality Sr<sub>2</sub>FeMoO<sub>6</sub> is from the most thorough grinding and gives a close to ideal Fe/Mo ordering and magnetic moment close to 4 Bohr magneton per formula unit.

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