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Crystal Structure and Magnetic Properties of Novel Double Perovskite Ca_2ScOsO_6 DAVID RUSSELL, SHAHAB DERAKHSHAN, CSULB, BRENT MELOT, USC — Transition metal oxides (TMOs) with face centered cubic arrangement of magnetic ions are composed of triangular sub-lattices. When anti-ferromagnetic (AFM) interactions of the same strengths between all three pathways in triangular settings are in place, spin constraints cannot be fulfilled simultaneously and the system undergoes geometric magnetic frustration (GMF). The new B-site ordered double perovskite, Ca_2ScOsO_6, was synthesized in polycrystalline form by a solid-state method, and predicted to exhibit the GMF phenomenon. The crystal structure of Ca_2ScOsO_6 was refined from powder x-ray diffraction data. This system crystallizes in the monoclinic $P2_1/n$ space group with a= 5.4719(1)A, b = 5.6197(1)A, c = 7.8184 (1)A and = 89.893(2) degrees. The temperature-dependent magnetic susceptibility data reveal that the system undergoes a long-range AFM ordering below 67K. The magnetic frustration index, $f \approx 3.17$ suggest that the system exhibits moderate geometric magnetic frustration. The relative strength of various magnetic exchange interactions was calculated employing spin dimer analysis method.

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