

NMR study of successive magnetic transitions in A-site-ordered perovskite $\text{LaMn}_3\text{Cr}_4\text{O}_{12}$

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In a simple ABO_3 perovskite, when 75% of the A-site cations are substituted by another element, an A-site-ordered perovskite with a chemical formula of $\text{A}'\text{A}_3\text{B}_4\text{O}_{12}$ can be formed. These materials have attracted much attention, because they show a rich variety of physical phenomena, such as heavy-fermion behavior in $\text{CaCu}_3\text{Ru}_4\text{O}_{12}$, due to the A-A and/or A-B exchange interactions in addition the usual B-B exchange interaction seen in simple perovskite materials.

Recently, new A-site-ordered perovskite, $\text{LaMn}_3\text{Cr}_4\text{O}_{12}$, was prepared by using high-pressure synthesis. The measurements of magnetic susceptibility and specific heat suggest two antiferromagnetic transitions at 150 K and 50 K in $\text{LaMn}_3\text{Cr}_4\text{O}_{12}$. In this conference, we report microscopic investigation on the magnetic properties of this material probed by La-NMR. The temperature dependence of Knight shift in La-NMR spectrum indicates that the transition at 150 K is associated with the B-site Cr spin ordering and the other at 50 K is due to the A-site Mn spin ordering.