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Incommensurate magnetic order from a geometrically frustrated spinel $CdCr_2O_4$ JAE-HO CHUNG, University of Maryland and NIST Center for Neutron Research, MASAAKI MATSUDA, Japan Atomic Energy Research Institute, HIROAKI UEDA, YUTAKA UEDA, HIDENORI TAKAGI, University of Tokyo, KUN-PYO HONG, SUNGIL PARK, Korea Atomic Energy Research Institute, SEUNG-HUN LEE, NIST Center for Neutron Research — In an ideal pyrochlore lattice, antiferromagnetic spins are three-dimensionally frustrated and do not order down to zero temperature. It is often found in real life, however, that a long-range order appears by a symmetry-breaking transition at an ordering temperature much lower than Curie-Weiss temperature. $ZnCr_2O_4$ is a well-known example showing a long-range commensurate magnetic order that is coincident with a cubic-to- tetragonal distortion with $c < a$. In this study, we have observed a closely-related compound $CdCr_2O_4$, which has a larger A-site ion. Interestingly, the cubic-to-tetragonal distortion occurred with $c > a$, and the coincident magnetic order turned out to be incommensurate. This indicates that the nonmagnetic A-site ions play a ciritical role in determining the ground state properties of the chromate spinels. We present the model for the spin structure, and discuss the possible mechanisms that can lead to the incommensurate order.

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