

Abstract Submitted
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Spin reorientation and Ce-Mn coupling in antiferromagnetic oxypnictide CeMnAsO¹ DAVID VAKNIN, QIANG ZHANG, SPENCER PETERSON, KEVIN DENNIS, Ames Laboratory, Iowa State University, WEI TIAN, Oak Ridge National Laboratory — Structure and complex magnetic properties of CeMnAsO, a parent compound of the “1111”-type oxypnictides, have been investigated using neutron powder diffraction and magnetization measurements. Whereas there is no structural transition from the P4/nmm tetragonal phase below 420 K, CeMnAsO undergoes a C-type antiferromagnetic order with Mn²⁺ ($S = 5/2$) moments pointing along the c -axis below a relatively high Néel temperature of $T_N = 345$ K. Below $T_{SR} = 35$ K, two instantaneous transitions occur where the Mn moments reorient to the ab -plane preserving the C-type magnetic order, and Ce moments undergo long-range AFM ordering with moments in the ab -plane. Another transition to a noncollinear magnetic structure occurs below 7 K. We find that CeMnAsO primarily falls into the category of a local-moment antiferromagnetic insulator in which the nearest-neighbor interaction (J_1) is dominant. The spin reorientation transition driven by the coupling between rare earth Ce and transition metal seems to be common to Mn, Fe and Cr ion, but not to Co and Ni ions in the iso-structural oxypnictides.

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