Magnetic Structure and Crystal Field Potential of PrOs$_4$As$_{12}$

SONGXUE CHI, PENGCHENG DAI, The University of Tennessee, Knoxville, H.J. KANG, J.W. LYNN, NIST Center for Neutron Scattering, F. YE, Oak Ridge National Laboratory, Z. HENKIE, A. PIETRASZKO, Institute of Low Temperature and structure research, Poland, M.B. MAPLE, University of California, San Diego — Neutron powder diffraction and elastic neutron scattering have been used to determine the magnetic structure of the Filled Skutterudite compound PrOs$_4$As$_{12}$. The system becomes antiferromagnetically ordered with a Neel temperature ($T_N$) at 2.28K, which has A-type magnetic structure with spins lying along the doubled axis of the magnetic unit cell. The crystal field potential of PrOs$_4$As$_{12}$ has been studied by inelastic neutron scattering (INS). The ground state in the $T_h$ point group symmetry is determined to be a $\Gamma_5$ triplet. This is confirmed by Zeeman effect exhibited at low temperatures under high magnetic fields.

1The work was supported by DOE DE-FG02-05ER46202. ORNL is managed by UT-Battelle, LLC, for the U.S. Dept. of Energy under contract DE-AC05-00OR22725.