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Jian He, Brian Sales, Rongying Jin, Stephen Nagler, Mark Lumsden, David Mandrus, David Singh, *CrSb₂: A Spin S=1 Heisenberg Chain?*, Bull. Am. Phys. Soc., APS March Meeting, 2004.

CrSb: A Spin=1/2 Heisenberg Chain?, JIAN HE, Department of Physics and Astronomy, University of Tennessee, Knoxville, TN 37996, BRIAN SALES, Condensed Matter Science Division, Oak Ridge National Laboratory, TN 37831, RONGYING JIN, Condensed Matter Science Division, Oak Ridge National Laboratory, TN 37831, STEPHEN NAGLER, Condensed Matter Science Division, Oak Ridge National Laboratory, TN 37831, MARK LUMSDEN, Condensed Matter Science Division, Oak Ridge National Laboratory, TN 37831, DAVID MANDRUS, Condensed Matter Science Division, Oak Ridge National Laboratory, TN 37831, DAVID SINGH, Complex Systems Branch, Naval Research Laboratory, Washington, DC 20375, COMPLEX SYSTEMS BRANCH, NAVAL RESEARCH LABORATORY, WASHINGTON, DC 20375 COLLABORATION— Low dimensional magnetism is unexpected in the intermetallic compounds because these materials tend to crystallize in close-packed structures with fewer possibilities for exchange anisotropy to develop. Here we present first-principles calculations and experimental data that suggest CrSb is the first intermetallic quasi-1D magnet. CrSb crystallizes in the orthorhombic marcasite structure, and is semiconducting with a broad peak in the magnetic susceptibility near 550 K. While magnetic susceptibility data shows no evidence of long range magnetic ordering for temperatures above 2 K, the specific heat, neutron scattering, and first-principles results are consistent with a long-range antiferromagnetic order developing below $T=275$ K. The peculiar magnetic and transport properties of this compound will be discussed. Oak Ridge National Laboratory is managed by UT-Battelle, LLC, for the U.S. Department of Energy under contract DE-AC05-00OR22725.
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