

Abstract Submitted
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NMR Study of Cu₂Se Superionic Conductor¹ ALI SIRUSI ARVIJ, JOSEPH H. ROSS, JR., Department of Physics and Astronomy, Texas A&M University, College Station, Texas 77843, SEDAT BALLIKAYA², Department of Physics, University of Istanbul, Vezneciler, Istanbul, 34134, Turkey, CTIRAD UHER, Department of Physics, University of Michigan, Ann Arbor, MI 48109, USA — We will report NMR measurements of Cu₂Se which address the unusual movements of Cu ions in this compound. This material has attracted great attention recently because of attempts to identify high performance thermoelectric materials. Cu₂Se is a superionic conductor with fast ionic motion at high temperatures and a structural phase transition around 410K. NMR is a powerful local probe which can provide information about electronic and structure plus dynamical properties of the compounds. Here we have performed ⁶³Cu and ⁶⁵Cu NMR at low and high temperatures. The spectra at low temperatures indicate slow Cu ionic motion is initiated at 90K, coinciding with the recent reports of a new phase transition at this temperature. The high temperature spectra show motional narrowing above room temperature. Over the range of 360-400K the gradual phase transition is clearly shows itself through broadening of the spectra. The Knight shift continues to increase at high temperatures which is a measure of electronic gap and charge carriers thermally induced at these temperatures.

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