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Study on the Lattice Dynamics of the Argyrodite $Ag_8GeTe_6^{-1}$ DALE HITCHCOCK, EMILY THOMPSON, JIAN HE, Department of Physics and Astronomy, Clemson University, Clemson, SC 29634, USA, ISAAC BREDESEN, VEELRE KEPPENDS, DAVID MANDRUS, Department of Material Science and Engineering, University of Tennessee, Knoxville, TN 37996, USA — Ag₈GeTe₆ was initially studied as a super ionic-electronic mixed conductor in the 1970s, and more recently has attracted new interest for its thermoelectric performance. A key to the desirable thermoelectric performance of Ag_8GeTe_6 is its exceptionally low lattice thermal conductivity (~ 0.25 W/m*K at 300K), which is intimately related to its structure, consecutive structural instabilities, and unusual lattice dynamics (e.g., anharmonicity). In this work, we have studied Ag_8GeTe_6 by means of thermal conductivity, electrical conductivity, Seebeck coefficient, Hall coefficient, magnetic susceptibility, resonant ultrasound spectroscopy (RUS), photoacoustic spectroscopy, and synchrotron x-ray diffraction at low temperatures in order to further understand the coexistence of mixed conduction and high thermoelectric performance at elevated temperatures.

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