

Metal to semimetal transition in CaMgSi crystals grown from Mg-Al flux

Whalen, J.B.^{1,2}; Zaikina, J.V.¹; Achey, R.¹; Stillwell, R.²; Zhou, H.D.²; Wiebe, C.R.²; Lattner, S.E.¹

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¹Florida State University Department of Chemistry and Biochemistry

²National High Magnetic Field Laboratory



The Ca/Mg/Si ternary system is of interest due to the light weight and low cost of these elements, and for potential use as hydrogen storage materials. We have been able to grow very large crystals of the equimolar CaMgSi phase from a Mg / Al (50 at.% / 50 at.%) molten flux with the addition of elemental Ca and Si. DOS calculations show a pseudogap at E_f . Resistivity and magnetic susceptibility data collected on single crystals of CaMgSi also support poor metallic behavior at ambient temperatures; however, a metal to semiconductor transition is seen at 50 K.

