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Transport Properties Of Type-I Sn Clathrates[1] PETER EGBELE, DANIEL JOUBERT, University of the Witwatersrand, ELVIS SHOKO, king abdulah university, Soudi Arabia — The conversion of waste heat into useful energy can contribute to the efficient use of available energy. This includes converting heat energy from internal combustion engines, conventional power plants and solar cells into usable energy. Thermoelectric devices can convert heat into an electric current and have immense potential for utilizing heat energy. One of the desired features of an efficient thermoelectric material is a low lattice thermal conductivity. In this study thermal transport properties of type-I Sn clathrates are investigated. We study the dynamics of the guest atoms Cs and K in the compound A_8 Sn_{44} (A = Cs, K). We find that the guest atom are responsible for scattering of the heat in these systems, and hence responsible for the low thermal conductivity in these materials. These compounds are formed in a cubic lattice. A low thermal conductivity value of 0.17 and 0.18 W m^{-1} K^{-1} at 300 K respectively, was calculated for Cs_8 Sn_{44} and K_8 Sn_{44} . These are low values which makes these and similar materials attractive for further study.

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