THE CONDUCTION MECHANISMS IN n-ZrNiSn INTERMETALLIC SEMICONDUCTOR HEAVILY DOPED WITH A Cu DONOR IMPURITY

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S u m m a r y

The calculations of the electronic structure for intermetallic semiconductor ZrNiSn heavily doped with donor impurities through a Cu substitution for Ni are performed. The conduction mechanisms for n-ZrNiSn with various concentrations of donor impurities are analyzed within the temperature region 80 — 380 K. The insulator-metal conduction transition (the Anderson-type transition), which is caused by a shift of the Fermi level from the impurity donor band to the conduction band upon an increase in the donor impurity concentration and was predicted by model calculations, is revealed in the $ZrNi_{1-x}Cu_xSn$ solid solution. The dependence of a thermoelectric power coefficient Z^* on the concentration of Cu donor impurities is specified for n-ZrNiSn in the temperature region 80—380 K.