

MECHANISM OF CONDUCTIVITY IN n -ZrNiSn
INTERMETALLIC SEMICONDUCTOR DOPED
WITH YTTRIUM ACCEPTOR IMPURITY

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S u m m a r y

The X-ray diffraction and phase analyses have been used to determine the crystal structure of the ZrNiSn intermetallic semiconductor (the half-Heusler alloy) highly doped by substituting Y atoms for Zr ones. The corresponding electronic structure has been calculated. The temperature and concentration dependences of the resistivity and the thermopower coefficient of the substitutional solid solution $Zr_{1-x}Y_xNiSn$ have been studied in the temperature interval from 80 to 380 K. A conductivity transition of the insulator-metal type caused by a change of the relative arrangement of the Fermi level and the percolation level in the valence band due to the variation of the compensation degree in $Zr_{1-x}Y_xNiSn$ has been observed. A correlation between the magnetic susceptibility and the electric conductivity of $Zr_{1-x}Y_xNiSn$ has been demonstrated.