

INFLUENCE OF HEAT TREATMENT
MODES ON THE ELECTRICAL CONDUCTIVITY
OF HEAVILY DOPED n -ZrNiSn INTERMETALLIC
SEMICONDUCTORS. 1. EXPERIMENTAL RESULTS

V.A. Romaka^{1,2}, *Yu.K. Gorelenko*³, *Yu.V. Stadnyk*³,
*L.P. Romaka*³, *M.G. Shelyapina*⁴, *D. Fruchart*⁵,
*V.F. Chekurin*¹, *A.M. Horin*³

¹Ya. Pidstryhach Institute of Applied Problems
of Mechanics and Mathematics,
Nat. Acad. Sci. of Ukraine
(3b, Naukova Str., Lviv 79060, Ukraine),

²National University "Lviv'ska Politekhnik" (12, Bandera Str., Lviv 79013, Ukraine;
e-mail: vromaka@polynet.lviv.ua),

³Ivan Franko Lviv National University
(6, Kyryl and Mefodii Str., Lviv 79005, Ukraine;
e-mail: gorelenko_yuriy@franko.lviv.ua),

⁴V.A. Fock Institute of Physics
of the St.-Petersburg National University
(1, Ul'yanovskaya Str., Petrodvorets, St.-Petersburg
198504, Russia; e-mail: marinashelyapinna@mail.ru),

⁵Laboratoire de Cristallographie, CNRS
(BP 166, Grenoble 38042, Cedex 9, France;
e-mail: daniel.fruchart@grenoble.cnrs.fr)

S u m m a r y

The model of impurity band reconstruction has been proposed for n -ZrNiSn intermetallic semiconductor doped with acceptor impurities. The hardening of heavily doped n -ZrNiSn specimens, in contrast to the tempering procedure, has been found to result in a substantial shift of the Fermi level and a considerable variation of the majority and minority charge carrier concentrations, provided that the concentrations of acceptor impurities were identical in both cases. This phenomenon can be caused, besides other reasons, by different degrees of local deformations in polycrystalline semiconductor specimens.