

THERMOELECTRIC PROPERTIES OF P-AND N-TYPE Mg₂Si COMPOUNDS OBTAINED BY MELTING METHOD

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The p- and n-type Mg₂Si compounds have been prepared in the tantalum crucibles by melting the pure elements mixed in stoichiometric proportions and also with some excess of Mg. The reaction was conducted under inert gas condition in a special apparatus. Finally, samples were formed by a high-temperature pressing technique (HP). The structural and phase composition of the obtained materials were investigated by X-ray diffraction method. The morphology of the samples was examined by scanning electron microscopy (SEM). Thermoelectric properties were defined by the Seebeck coefficient, electrical conductivity and thermal conductivity measurements in the temperature range 500 - 800K. To understand better these experimental results, electronic band structure calculations were performed using both the FLAPW and KKR methods. The measured electron transport behaviors are discussed in view of the computed microscopic properties, as band gap, carrier effective masses, density of states features, and satisfying agreement was found.

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