THE THERMOELECTRIC POWER OF FERROMAGNETICALLY ORDERED $Zn_xCu_yCr_zSe_4$ SINGLE CRYSTALS

T. Groń[1], I. Jendrzejewska[2], S. Gołąbek[1], H. Duda[1], A. Krajewski[1], A. Waśkowska[3], I. Okońska-Kozłowska[2], K. Bärner[4]

[1]University of Silesia, Institute of Physics, ul. Uniwersytecka 4, 40-007 Katowice, Poland
[2]University of Silesia, Institute of Chemistry, ul. Szkolna 9, 40-006 Katowice, Poland
[3]Institute of Low Temperature and Structure Research, Polish Academy of Sciences, ul. Okólna 2, 50-950 Wrocław, Poland
[4]Universität Göttingen, IV Physikalisches Institut, Bunsenstraße 13-15, 37073 Göttingen, Germany

The absolute thermoelectric power and the electrical resistivity of the $Zn_xCu_yCr_zSe_4$ ferromagnetic single crystals have been measured in <001> direction and in the temperature range from 5 to 400 K between y=0.81 and 0.97. The above investigations showed that all compounds under study are p-type metallic conductors. It was observed that the thermoelectric power can be explained concerning only the diffusion component (which varies linearly with temperature) and a magnon drag contribution. The positive slope of the linear part of thermopower does not depend significantly on the Cu concentration y in a sample. Generally, a high magnon drag peak for the single crystals with small defectiveness is observed. One can conclude, that in the spinels under study the strong ferromagnetic coupling between the nearest neighbours of the chromium ions makes easier the magnon excitation on the one hand, and the increase of the sample defectiveness hinders the magnon excitation on the other.

Abstract category: 3
Preference: poster presentation

Address: T. Groń
Uniwersytet Śląski
Instytut Fizyki
ul. Uniwersytecka 4
40-007 Katowice

e-mail:gron@us.edu.pl