Komitet za termodinamiku i fazne dijagrame Srbije

u saradnji sa:

Fakultetom tehničkih nauka u Kosovskoj Mitrovici,
Tehničkim fakultetom u Boru i
Associated Phase Diagram and Thermodynamics Committee
(Poland, Czech Republic, Hungary, Bulgaria, Slovenia, Serbia, Montenegro, Romania, Croatia, Bosnia and Herzegovina)

JEDANAESTI SIMPOZIJUM O TERMODINAMICI I FAZNIM DIJAGRAMIMA

sa međunarodnim učešćem

ZBORNIK IZVODA RADOVA

Kosovska Mitrovica,
23-24. jun 2023. god.

Jedanaesti simpozijum o termodinamici i faznim dijagramima

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Godina izdavanja:
2023

Tiraž: 100 primeraka
ISBN: 978-86-81656-63-1

Štampa: SaTCIP d.o.o. Vrnjačka Banja

Na osnovu člana 55. stav. 1. tačke 8. i 38. Statuta Fakulteta tehničkih nauka u Kosovskoj Mitrovici, Nastavno-naučno veće na svojoj sednici održanoj dana 10.02.2023. godine, donelo je ODLUKU br. 126/3-8 o organizovanju naučnog skupa u 2023. godini, pod naslovom: „Jedanaesti simpozijum o termodinamici i faznim dijagramima“.

Simpozijum je finansijski podržan od strane Ministrastva nauke, tehnološkog razvoja i inovacija Republike Srbije

Jedanaesti simpozijum o termodinamici i faznim dijagramima

Naučni odbor

Organizacioni odbor

Sadržaj

Plenarno predavanje:

Izvodi radova:

Microstructure and thermal properties of Ag–Sb alloys

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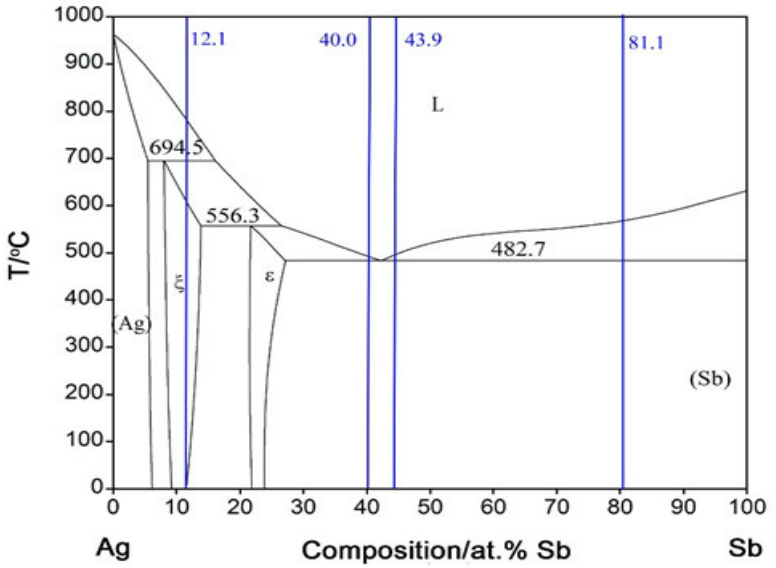
Abstract

In this work, the microstructure and thermal properties of four Ag–Sb alloys with 12.1, 40.0, 43.9 and 81.1 at.% Sb were experimentally studied. The constitutive phases were investigated using scanning electron microscopy (SEM) with the energy dispersive spectroscopy (EDS). The phase transition temperatures of the investigated alloys were determined using differential scanning calorimetry (DSC) and compared with the results obtained by thermodynamic calculation. The measured temperature of the eutectic reaction was 484.1 °C. The measurement of thermal diffusion in the temperature range from 25 to 400 °C was performed using the xenon-flash method, followed by the determination of the thermal conductivity. Temperature and composition dependences of density, thermal diffusivity, specific heat capacity and thermal conductivity for solid Ag-Sb alloys were determined. Thermal conductivity of Ag–Sb alloys shows large negative deviation from a linear rule of mixing. Thermal diffusivity and thermal conductivity are the lowest for the Ag-12.1 at.% Sb alloy and gradually increase with increasing antimony content.

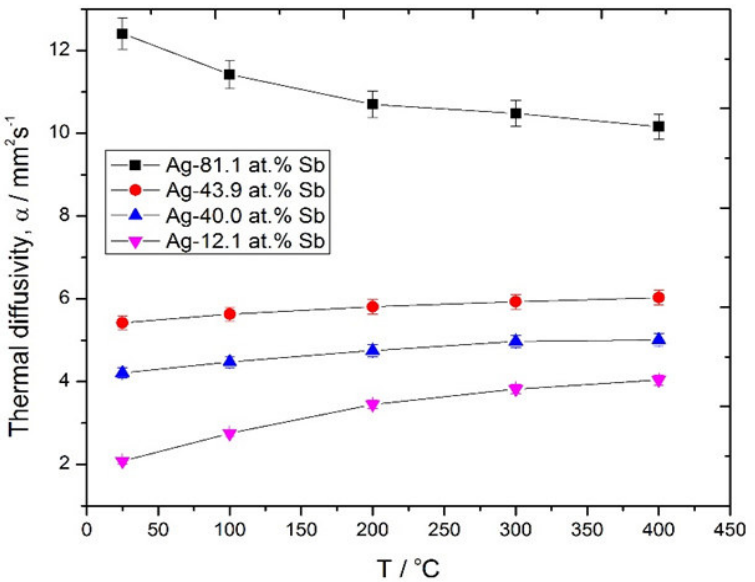
Acknowledgement

The research presented in this paper was done with the financial support of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, within the funding of the scientific research work at the University of Belgrade, Technical Faculty in Bor, according to the contract with registration number 451-03-47/2023-01/200131.

Graphical abstract:



The phase diagram of the Ag-Sb system with marked compositions of the alloys studied in the present work.



Temperature dependence of thermal diffusivity for the studied Ag-Sb alloys.