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

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Sadržaj

Plenarno predavanje:

Izvodi radova:

Microstructural and mechanical properties of the ternary Cu-Ge-Pb system

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Abstract

Ternary Cu-Ge-Pb system has previously been investigated by our group [1]. In the ternary Cu-Ge-Pb system, three vertical sections (Cu-GePb, Ge-CuPb and Pb-CuGe) and two isothermal sections at 400 and 600 °C were examined. However, what has been investigation in this paper, and it refers to mechanical properties, has not been tested in any form so far. Copper-based alloys are primarily interesting due to their strength [2,3], which is why these properties were taken into consideration for investigation. In addition to mechanical properties, an isothermal section at 25 °C was also tested. The same thermodynamic parameters [1] were used in this paper for the calculation of the isothermal section at 25 °C. The experiments were performed using various techniques such as scanning electron microscopy (SEM) with energy dispersive spectroscopy (EDS), X-ray diffractometric analysis (XRD), and light optical microscopy (LOM). Hardness was measured with Brinell test for hardness. Experimental results were compared with calculated phase diagrams of isothermal section at 25 ° C and a good agreement was obtained between calculated phase diagrams and experimental data. Based on the experimental results obtained for hardness and using an appropriate mathematical model, the properties of alloys in the whole range of compositions are predicted. Changes in hardness with changes in alloy composition were monitored.

Acknowledgement

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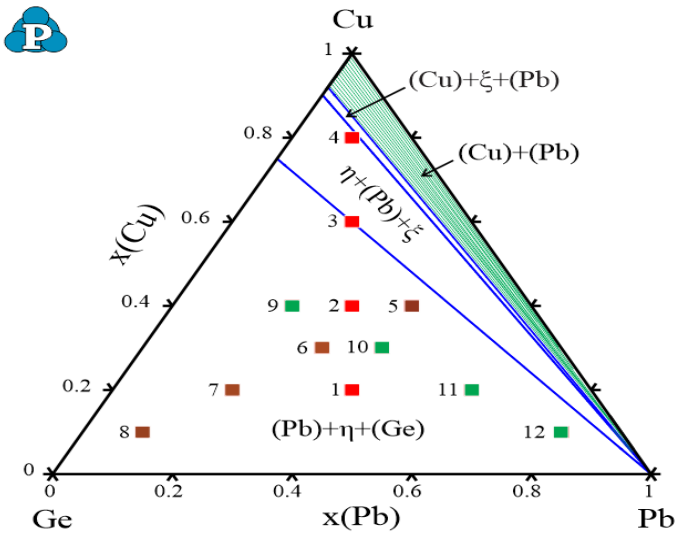
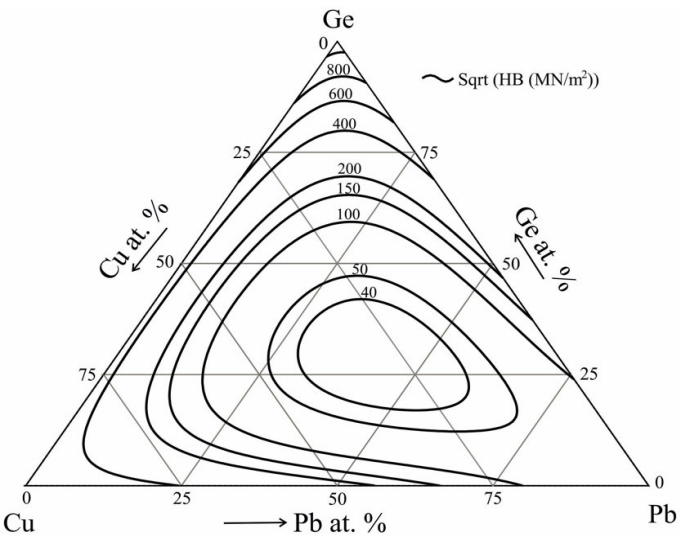
Graphical abstract:



The predicted isothermal section at 25 ºC and composition of 12 ternary samples.



Calculated iso-lines of Brinell hardness in ternary Cu-Ge-Pb system.