

Accepted Manuscript

Title: Mixing enthalpies of liquid Bi–Ni and Ag–Bi–Ni alloys

Authors: Przemyslaw Fima, Hans Flandorfer

PII: S0040-6031(17)30223-X
DOI: <http://dx.doi.org/10.1016/j.tca.2017.09.002>
Reference: TCA 77818



To appear in: *Thermochimica Acta*

Received date: 25-11-2016
Revised date: 6-8-2017
Accepted date: 1-9-2017

Please cite this article as: Przemyslaw Fima, Hans Flandorfer, Mixing enthalpies of liquid Bi–Ni and Ag–Bi–Ni alloys, Thermochimica Acta <http://dx.doi.org/10.1016/j.tca.2017.09.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Mixing enthalpies of liquid Bi–Ni and Ag–Bi–Ni alloys

Przemyslaw Fima ^{1,#} and Hans Flandorfer ²

1 - Institute of Metallurgy and Materials Science, Polish Academy of Sciences, ul. Reymonta 25, 30-059 Krakow, Poland

2 - Department of Inorganic Chemistry – functional materials, University of Vienna, Alhan Str. 14, A-1090 Vienna, Austria

- corresponding author, tel. +48 12 2952824, fax +48 12 2952804, e-mail: p.fima@imim.pl

Highlights

- Partial and integral mixing enthalpies of liquid Bi–Ni and Ag–Bi–Ni alloys were measured.
- Integral mixing enthalpies of Bi–Ni alloys are small and exothermic.
- Integral mixing enthalpies of Ag–Bi–Ni are negative on Bi–Ni side and positive elsewhere.
- The ternary data were fitted on the basis of Redlich–Kister–Muggianu model.

Abstract

Partial and integral enthalpies of mixing of liquid Bi–Ni alloys were determined at 1273 K, while enthalpies of mixing of ternary Ag–Bi–Ni alloys were determined at 1173 K over a broad composition range along six sections: $x(\text{Ag})/x(\text{Bi}) = 3/2, 1, 2/3, 3/7, 1/4$; $x(\text{Bi})/x(\text{Ni}) = 4$. Measurements were carried out using Calvet type microcalorimeters and drop calorimetric technique. It was found that integral enthalpies of mixing of binary Bi–Ni alloys are small exothermic, whereas integral mixing enthalpies of ternary Ag–Bi–Ni alloys change sign from negative to positive with decreasing Bi content. The ternary data were fitted on the basis of an extended Redlich–Kister–Muggianu model for substitutional solutions, and additional ternary interaction parameters were determined. From experimental ternary data the range of liquid at 1173 K was deduced.

Keywords Bi–Ni, Ag–Bi–Ni; Drop solution calorimetry; Enthalpy of mixing; Liquid alloys

1. Introduction

The Ag–Bi–Ni system is one of the systems of practical importance in soldering [1, 2]. Over the years different authors were developing soldering related thermodynamic databases [3-5] and their efforts were motivated by two major reasons. One was the ban of use of Pb in consumer

Download English Version:

<https://daneshyari.com/en/article/4995817>

Download Persian Version:

<https://daneshyari.com/article/4995817>

[Daneshyari.com](https://daneshyari.com)