

Accepted Manuscript

Isothermal section at 600 °C of the Yb–Pd–Sn system ($\text{Pd} \leq 75 \text{ at}\%$)

F. Gastaldo, M. Giovannini, A.M. Strydom, R.F. Djoumessi, I. Čurlík, M. Reiffers, P. Solokha, A. Saccone



PII: S0925-8388(16)33052-3

DOI: [10.1016/j.jallcom.2016.09.289](https://doi.org/10.1016/j.jallcom.2016.09.289)

Reference: JALCOM 39123

To appear in: *Journal of Alloys and Compounds*

Received Date: 6 May 2016

Revised Date: 2 September 2016

Accepted Date: 27 September 2016

Please cite this article as: F. Gastaldo, M. Giovannini, A.M. Strydom, R.F. Djoumessi, I. Čurlík, M. Reiffers, P. Solokha, A. Saccone, Isothermal section at 600 °C of the Yb–Pd–Sn system ($\text{Pd} \leq 75 \text{ at}\%$), *Journal of Alloys and Compounds* (2016), doi: 10.1016/j.jallcom.2016.09.289.

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.

Isothermal section at 600 °C of the Yb–Pd–Sn system (Pd ≤ 75 at%)

F. Gastaldo¹, M. Giovannini^{*,1,2}, A.M. Strydom³, R. F. Djoumessi³, I. Čurlík⁴, M. Reiffers^{4,5}, P. Solokha¹, A. Saccone¹

¹Department of Chemistry, University of Genova, Via Dodecaneso 31, I-16146 Genova, Italy

²CNR-SPIN, Corso Ferdinando Maria Perrone 24, I-16152, Genova, Italy

³Highly Correlated Matter Research Group, Department of Physics, University of Johannesburg, PO Box 524, Auckland Park 2006, South Africa

⁴Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, SK 080 78 Prešov, Slovakia

⁵Institute of Experimental Physics, Slovak Academy of Sciences, Watsonova 47, SK 043 53 Košice, Slovakia

Keywords: Phase Diagrams, Intermetallics, Rare Earth Alloys and Compounds

ABSTRACT

Phase equilibria in the Yb–Pd–Sn ternary system at 600 °C were established in the Pd ≤ 75 at.% concentration range employing X-ray diffraction (XRD), scanning electron microscopy (SEM) and electron probe micro-analysis (EPMA). Besides the known intermetallic compounds, three new ternary intermetallics were revealed in the system, together with homogeneity ranges into the ternary field for some binary phases. Magnetic properties for the new compounds were investigated revealing stable Yb states Yb³⁺ for Yb₃Pd₄Sn₁₃ and Yb²⁺ for Yb₅Pd₃₉Sn₅₆, whereas for Yb₁₃Pd₄₀Sn₃₁ an unstable valency of Yb is suggested.

1. Introduction

The ternary intermetallics R_xT_yX_z (R = Ce and Yb, T = transition metals and X = p-block elements) are potentially good candidates to exhibit or combine unusual electronic and magnetic effects, such as superconductivity, intermediate valence, heavy fermion (HF) behavior, Kondo interactions and quantum phase transitions. These interesting phenomena can be found especially in Yb- and Ce-based intermetallics due to hybridization of *f*-electrons and conduction electrons [1-3]. Furthermore, the systematic search for new Yb-compounds is motivated from the fact that, in

* Contact person: Tel: +39 010 3536648

Fax: +39 010 3536163

E-mail: mauro.giovannini@unige.it

Download English Version:

<https://daneshyari.com/en/article/5460896>

Download Persian Version:

<https://daneshyari.com/article/5460896>

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