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The phase equilibria in the Sb-Sn system – part II: experimental results

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Abstract

Based on results from XRD, SEM/EDX and DTA, a new version of the Sb-Sn phase diagram was established that includes the Sb_3Sn_4 phase with $R-3m$ space group and a commensurately ordered superstructure that can be derived from stacking seven layers of the conventional rhombohedral SbSn cell. The close structural relationships between these two structures have so far caused Sb_3Sn_4 to be overlooked in most works. The phase Sb_2Sn_3 , which had been established in some phase diagram versions without clear proof or structural description could be ruled out. Seemingly diverging literature results can now be explained in a consistent way based on a comprehensive literature review in part I and the new data from the present work, part II.

Key words

A. electrode materials; A. intermetallics; A. metals and alloys; C. phase diagrams; C. crystal structure

1. Introduction

In part I [1] we discussed the scientific and technological importance of the Sb-Sn phase diagram in detail. The current state of knowledge in terms of experimental phase relations was established through a comprehensive and thorough review of the available literature data. It was concluded that existing controversies in the Sb-Sn system require a new experimental study with focus on the complex

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