Themo	atic S	Section:	Physicochemical Studies.							Full Paper
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Subsection: Phase Equilibrium. Registration Code of Publication: 11-25-8-41

Publication is available for discussion in the Internet as a material of "All-Russian Working Chemical Conference "*Butlerov's Heritage-2011*". http://butlerov.com/bh-2011/Contributed to editorial board: April 14, 2011.

Thermodynamic assessment of phase composition of Si-based binary and ternary Si-Al(B)-Ti alloys

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Keywords: thermodynamic assessment, phase equilibria, Si-based solid solution.

Abstract

With the use of computational methods of chemical thermodynamics the thermodynamic properties of solid solutions of aluminum and boron in silicon and compound SiB_3 have been evaluated. As a result of calculation and analysis of phase equilibria in the systems Si-Al-Ti and Si-B-Ti in the temperature-concentration-traditional areas of existence of solid solution on the basis of silicon we substantiated thermodynamically the isolation of compounds $Ti_7Al_5Si1_4$ and TiB_2 , respectively.