BOOK REVIEWS

**Ananichev, V.A., *Ob''emnaya dilatometriya khal'kogenidnykh stekloobraznykh materialov (Volumetric Dilatometry of Chalcogenide Glassy Materials),*
St. Petersburg: Izd. Politekhnikeskogo Univ., 2007, 166 pp.**

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The discovery of semiconducting glasses by N.A. Goryunova and B.T. Kolomiets in the middle of the XX century stimulated studies of the whole set of physicochemical properties of these materials. Ananichev's book summarizes and analyzes methods and results of studying the thermal expansion of chalcogenide glasses and their melts in a wide temperature range.

The book consists of an introduction, eight chapters, and an appendix. In the brief Introduction (pp. 6–7), the author formulates the goal of the book and the problems considered. Very short Chapter 1 (pp. 8–18) presents the general relationships determining the cubic expansion coefficient of solids and liquids and, in particular, of chalcogenide glass melts. Chapter 2 (pp. 19–30) describes devices developed by V.A. Ananichev and co-workers for studying the thermal expansion of chalcogenide materials. Chapters 3 (pp. 31–72) and 4 (pp. 73–92) analyze experimental data on the thermal expansion of glasses and melts in chalcogenide and halogenide–chalcogenide systems. Chapter 5 (pp. 93–107) discusses, using specific examples, the features of isotherms expressing the composition dependence of the molar volume. It is noted that the maximal deviations from the additivity, suggesting the occurrence of ordering, in the isotherms of the molar volume of melts and glasses correspond to the compositions of compounds formed in the chalcogenide system and known from the phase diagrams. Chapter 6 (pp. 108–122) concerns the stability of chalcogenide glasses with respect to crystallization. The method of volumetric dilatometry, developed by the author, is sensitive to crystallization and furnishes useful information. Chapters 7 (pp. 123–136) and 8 (pp. 137–146) report

the results of studying the vitrification of melts of chalcogenide and halogen–chalcogenide systems, obtained by volumetric dilatometry. When discussing the results, the author proceeds from the fact that chalcogenide glasses are inorganic polymers and that the trends in variation of their properties in the glass transition range are satisfactorily described in terms of the fluctuation free volume theory.

In the Appendix (pp. 147–164), the author presents tabulated data on the density of glasses and melts for nine chalcogenide systems containing arsenic. The monograph is based on original experimental studies performed by the author. V.A. Ananichev developed devices allowing chalcogenide systems to be studied in a wide temperature range with high reliability. These devices are intended for measuring the cubic expansion coefficients both for melts of chalcogenide systems in the liquid and high-viscosity states and for solid chalcogenide materials. They allow determination of the crystallization parameters and density of glasses. All these devices, protected by Inventor's Certificates, were developed on the basis of simple and available measuring devices. The book is well written, it includes ample reference material. The lists of references are given to each chapter separately. Ananichev's book is included in the series "Chemistry in the Polytechnic University." The book can be useful for a wide range of researchers dealing with physicochemical studies of both chalcogenide systems and other objects. The presentation is very intelligible. The polygraphic quality of the book is very high.

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