

## BOOK REVIEWS

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### THERMOPHYSICAL PROPERTIES OF NONMETALLIC MATERIALS (OXIDES)\*

Reviewed by G. N. Dul'nev

There are many applications of materials consisting of oxides, either in pure form or as compounds; the applications are determined as a rule by several properties together, of which the physical properties are amongst the most important. This explains the importance of volumes such as this on the physical properties of oxides and oxide compounds.

The present handbook satisfies the needs of users in this respect to a very considerable extent.

This is the first handbook giving such complete information on oxides, as will be clear from the fact that it describes 33 different oxides and 7 compounds consisting of oxides, together with numerous physical properties. The topics covered include the following: molecular mass, structure characteristics (symmetry type, lattice type and parameters for each modification, conditions for transition from one modification to another, and so on), melting point, boiling point, density, thermal expansion, hardness, thermodynamic parameters (specific heat, enthalpy, heat of formation, entropy, entropy change between 0 and 298°K, standard free-energy change, and specific heats of fusion and evaporation), thermal conductivity, electrical parameters (electrical conductivity, Hall effect, superconducting transition, work function, etc.), some magnetic parameters, interactions with other substances, and various other useful pieces of information. In fact, the area covered is somewhat wider than that indicated by the title. The volume is rather a handbook on the physical properties of the oxides in which thermophysical properties play a major part.

Another feature of the handbook is the fairly extensive information on the effects of these properties from manufacturing techniques, impurities, test temperatures, lattice modifications, and porosity. The last parameter is decisive in the transport coefficients in the case of insulating materials and it is therefore reasonable that the authors have extended and extrapolated some of the available evidence to relate properties to porosity.

The structure of the book is that each section deals in detail with a given oxide, i. e., all the information on the given oxide is collected in one place, and the picture given is complete. Some Russian and other handbooks use a different principle: they consist of sections each dealing with some property of all the relevant materials. That mode of arrangement gives a clear concept of the variations in property with the composition, but then it loses the all-round representation of a given material, and this sometimes results in inconvenience in use.

Of course, this volume is also not free from deficiencies, which one hopes would be corrected in future editions. For instance, some of the graphs, although containing much information, are of value only for semiquantitative evaluation on account of their small scales used. There are also more minor failures.

In conclusion it should be noted that this book will prove valuable to many specialists.

One naturally hopes to see this type of handbook not only for oxides but also for other materials.

\* *Energiya*, Leningrad (1973).

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