

Second Edition

SILICATE GLASSES and MELTS

Bjorn Mysen and Pascal Richet

This book is an updated guide to the properties and structure of silicate glasses and melts, which are at the roots of the formation and subsequent evolution of the Earth, and are also of considerable industrial importance.

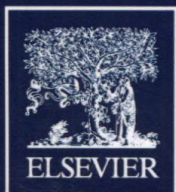
- Brings together multidisciplinary research scattered across the scientific literature into one reference, with a focus on silicate melts and application to natural systems
- Emphasizes linking melt properties to melt structure
- Includes a discussion of the pros and cons of the use of glass as a proxy for melt structure and properties
- Written by highly regarded experts in the field who, among other honors were the 2006 recipients of the prestigious G.W. Morey award of the American Ceramic Society

Silicate Glasses and Melts, Second Edition describes the structure-property-composition relationships of silicate glasses and melts from a geological and industrial perspective. Via their formation and movement, silicate melts make efficient mass transfer possible in the earth at high temperature and pressure. These processes have played a fundamental role in the formation and evolution of the Earth. For example, they are at the roots of volcanic activity, formation of new crust, some earthquake activity, and transfer of materials to form economically viable ore deposits. In materials science, glass, which results from cooling of melt to near room-temperature conditions, can serve as a proxy for melt. Additionally, glass is a fundamentally important component in a range of materials science and engineering applications.

The new edition of *Silicate Glasses and Melts* not only describes, discusses, and updates information that may have resided in the literature for some time, but also introduces new information (concepts, data, and interpretation) that has developed since the first edition was published in 2005. Updated information includes (i) characterization of silicate melt and COHN fluid structure (with and without dissolved silicate components) with pressure, temperature, and redox conditions and responses of structural variables to chemical composition; (ii) determination of solubility and solution mechanisms of COHN volatiles in silicate melts and minerals and of solubility and solution mechanisms of silicate components in COHN fluids; and (iii) effects of very high pressure on structure and properties of melts and glasses. This new book is an essential resource for researchers in a number of fields, including geology, geophysics, geoscience, volcanology, materials science, glass science, petrology, and mineralogy.

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