



Relaxation features of both strong and fragile glass systems

An invited talk Yue, Yuanzheng

Publication date: 2009

Document Version Publisher's PDF, also known as Version of record

Link to publication from Aalborg University

Citation for published version (APA):

Yue, Y. (2009). *Relaxation features of both strong and fragile glass systems: An invited talk*. Abstract from 8th Pacific RIM conference on ceramic and glass technology, Vancouver, Canada.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
 You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

Relaxation features of both strong and fragile glass systems

Yuanzheng Yue

Section of Chemistry, Aalborg University, DK-9000 Aalborg, Denmark

In this paper I review our recent findings about the features of relaxation in glass systems with different fragility. Firstly, we have found several striking anomalies of enthalpy relaxation in hyperquenched (HQ) SiO₂ and GeO₂ glasses (the strongest systems known so far) during annealing. The HQ strong glasses exhibit a symmetrical peak in the excessive heat capacity versus temperature curve. With the degree of annealing below T_g , the peak becomes smaller, but does not shift on the temperature axis. In case of the HQ fragile glasses, the low temperature cutoff of the excessive heat capacity peak shifts to higher temperature with the degree of annealing. The differences in relaxation pattern between strong and fragile systems are discussed in terms of the potential energy landscape, the glass structure, and the relative contributions from both primary and secondary relaxations. Secondly, We have found that unlike fragile glasses the strong glasses relax in a manner that all the secondary relaxation units contribute to the primary relaxation. Thirdly, we have established a new stretching function for the distribution of relaxation times, and found the substantial broadening of the glass transition region due to the hyperquenching process. Based on these findings and the modified TNM model we have succeeded in modeling the enthalpy response of HQ glasses to both dynamic heating and static aging.