



Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

Diffusion of Sodium in Sodium Boroaluminosilicate Glasses: Impact of Mixed Network Formers and the Influence of Water

Wu, Xinwei; Zheng, Qiuju; Mauro, John C.; Potuzak, Marcel; Ellison, Adam; Dieckmann, Rüdiger

Publication date:
2011

Document Version
Early version, also known as pre-print

[Link to publication from Aalborg University](#)

Citation for published version (APA):

Wu, X., Zheng, Q., Mauro, J. C., Potuzak, M., Ellison, A., & Dieckmann, R. (2011). *Diffusion of Sodium in Sodium Boroaluminosilicate Glasses: Impact of Mixed Network Formers and the Influence of Water*. Abstract from 2011 GOMD Annual Meeting of the American Ceramic Society, Savannah, United States.

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.

Diffusion of Sodium in Sodium Boroaluminosilicate Glasses: Impact of Mixed Network Formers and the Influence of Water

Xinwei Wu¹, Qiuju Zheng², John Mauro³, Marcel Potuzak³, Adam Ellison³, and Rüdiger Dieckmann¹

¹*Department of Materials Science and Engineering, Cornell university, Ithaca, New York, USA*

²*Section of Chemistry, Aalborg University, DK-9000 Aalborg, Denmark*

³*Science and Technology Division, Corning Incorporated, Corning, New York, USA*

To investigate how the diffusion of sodium in selected sodium boroaluminosilicate glasses is influenced by variations in the network former composition, sodium tracer diffusion measurements using the radioactive isotope sodium-22 have been performed.

Two series of glasses were considered,

$[(\text{Na}_2\text{O})_{0.71}(\text{Fe}_2\text{O}_3)_{0.05}(\text{B}_2\text{O}_3)_{0.24}]_{0.2}[(\text{SiO}_2)_x(\text{Al}_2\text{O}_3)_{1-x}]_{0.8}$ and

$[(\text{Na}_2\text{O})_{0.73}(\text{B}_2\text{O}_3)_{0.24}(\text{As}_2\text{O}_3)_{0.03}]_{0.18}[(\text{SiO}_2)_x(\text{Al}_2\text{O}_3)_{1-x}]_{0.82}$ with the composition parameter x varying between 0 to 1. Sodium tracer diffusion experiments were performed by diffusion annealing in dry and wet air at atmospheric pressure at different temperatures between 200 and 300 °C. The experimental results obtained will be presented and discussed.