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Publication date:
2011

Document Version
Early version, also known as pre-print

Link to publication from Aalborg University

Citation for published version (APA):
Diffusion of Sodium in Sodium Boroaluminosilicate Glasses: Impact of Mixed Network Formers and the Influence of Water

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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,

\([(Na_2O)_{0.71}(Fe_2O_3)_{0.05}(B_2O_3)_{0.24}]0.2[(SiO_2)_x(Al_2O_3)_{1-x}]0.8\) and
\([(Na_2O)_{0.73}(B_2O_3)_{0.24}(As_2O_3)_{0.03}]0.18[(SiO_2)_x(Al_2O_3)_{1-x}]0.82\) 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.