IONIC CHARACTER OF OXYGEN IN SILICATE GLASSES CONTAINING ALUMINA

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The ionic character of oxygen in silicate glasses containing alumina has been investigated by determination of the ion refractivity of oxygen(Ro). The value of Ro for the SiO_2-Al_2O_3 system increased with additions of alumina up to 30mol% but further additions resulted in a decrease. This indicates that oxygen ions are more ionic at lower concentrations of alumina but less ionic at higher concentrations. For the Na_2O-SiO_2-Al_2O_3 system, additions of alumina caused a small increase in Ro, which leads to a finding that oxygen ions bound to aluminum ions are slightly more ionic than those bound to silicon ions.