and 6. Here one finds that the saturation value for the densification, as well as the difference in the percentage densification, depend on the size of the cation. A most interesting calculation may be made for the packing density of all the saturated or maximum-density phases which have been achieved. It is found that the ratio volume of ions divided by molar volume is, in most of these cases, approximately 51 %, irrespective of the ratio for the original glass.

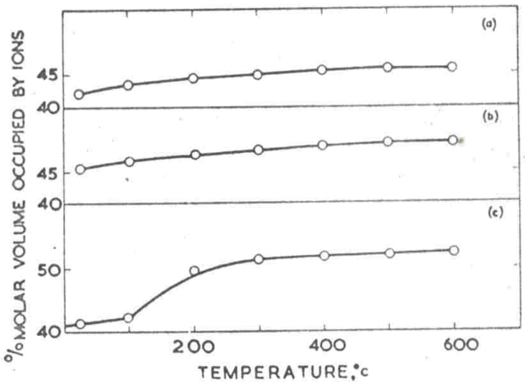

Fig. 5. *Ration of volume of the ions (Goldschmidt's radii) to the molar volume of the glass composition, measured at atmospheric pressure and room temperature, as a function of the temperature of the run*

densification at 40 kb
(a) $K_2O,0{\cdot}1MgO,2{\cdot}9SiO_2$,
(b) $Na_2O,0{\cdot}1MgO,2{\cdot}9SiO_2$
(c) $Li_2O,0{\cdot}1MgO,2{\cdot}9SiO_2$

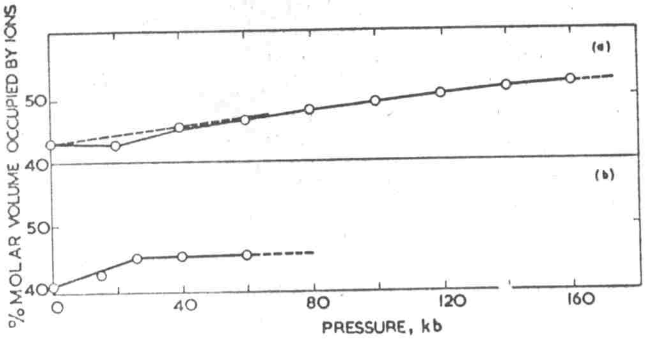

Fig. 6. *Ratio of volume of the ions (Goldschmidt's radii) to the molar volume of the glass composition, measured at atmospheric pressure and room temperature, as function of the pressure of the run*
(a) SiO_2 25°
(b) $K_2O,0{\cdot}1MgO,2{\cdot}9SiO_2$ 500°

Changes in optical absorption spectra and electrical properties of glasses

Although the results in these areas are far from complete, some are recorded to show the magnitude of the effects to be expected. From the structural work recorded above, it was clear that one could not expect a change of major co-ordination number of the network-forming cation. It was hoped however, that perhaps a change in the co-ordination of the network-modifying cations may be effected as a by product of the densification process. Co^{2+} and Ni^{2+} ions were used as colour indicators. It was hoped that, even though a complete co-ordination change of these ions may not be effected, it might be possible to find a lattice contraction effect analogous to that reported by Schmitz-Du Mont *et al.*[6] in the shift of the absorption maximum in spinels as a function of the general lattice parameter. No major changes were observed.

Recent interest in the dispersion of the dielectric loss offers the possibility of confirming the mechanism of the change hypothesised in Fig. 4. For this purpose, it will be necessary to be able to make measurements both at high pressure and high temperature as well as to repeat the measurement after quenching. Glasses of the composition $(2-x)Na_2O,xA1_2O_3,(6-2x)SiO_2$ have been prepared and cast into nearly bubble-free blocks by heating in iridium crucibles at 1800°, and thin wafers have been cut and polished from these. The dielectric properties of the glass were determined as a function of frequency at atmospheric pressure and the experiment has been repeated at pressures as high as 30 kb. Finally after release of the pressure (and after densification of the glass) the experiment has been repeated. Since thorough evaluation of the results is not yet complete, it would be misleading to present the data at this time.