Journal of Non-Crystalline Solids, **219** (1997) 57-61

Anomalous birefringence in nucleated $Li_2O\ 2SiO_2$ (LS2) and $Na_2O\ 2CaO\ 3SiO_2$ (NC2S3) glass melts

Joachim Deubener, Flavia de Moraes and Rolf Brückner
Institut für Nichtmetallische Werkstoffe, TU Berlin
Englische Str. 20, D-10587 Berlin

Abstract

Anomalous birefringent glasses are obtained by means of a thermomechanical treatment of quenched or pre-nucleated LS2 and NC2S3 glasses of stoichiometric compositions. In this procedure cylindrical glass samples are compressed in the viscoelastic temperature range above Tg under various loads and cooled under these loads slowly enough to avoid thermal stresses. In contrast to this, normal stress optical behavior of these glasses is observed at room temperature. The frozen-in anomalous birefringence may be correlated to a distribution birefringence, indicating order phenomena in the stoichiometric LS2 and NC2S3 glass melts. The results are compared with multicomponent di- and metasilicate glasses which show normal frozen-in birefringence. Microstructural heterogeneities are discussed to affect volume nucleation in the LS2 and NC2S3 glass melts.