Journal of Non-Crystalline Solids, **209** (1997) 283 - 291

Description and interpretation of two-phase flow behaviour of melts with suspended crystals

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

Abstract

New phenomenological flow equations, $\sigma(\varepsilon)$ and $h(\varepsilon)$ are developed for the non-Newtonian flow behaviour of suspended particles in a non- Newtonian fluid with "shear-thinnig effect" which can be used also for glass-ceramic melts (crystals in high-viscous glass melts) based on the superposition of recently developed flow equations for the non-Newtonian flow behaviour of single-phase glass melts. The viscosity decrease of the two-phase systems is a two-step decrease in contrast to the one-step decrease of the one phase fluids. This is evidenced experimentally and described well by the new equations of the present article. The measured values of two different glass-ceramic melts from the lithium disilicate systems were fitted by the equations with coefficients of regresssion $R^2 = 0.87$ to 0.96.