

shear modulus.

The diffusion coefficient,  $D$ , is given by,

$$D = D_0 e^{-(Q_d + PV_d)/kT} \quad (2)$$

where  $Q_d$  and  $V_d$  are respectively the activation energy and activation volume for self diffusion,  $P$  is the hydrostatic pressure and  $D_0$  is the pre-exponential frequency factor.

In a steady-state creep experiment the activation volume may be obtained by the change of slope method where the pressure is periodically cycled between two different pressure levels,  $P_1$  and  $P_2$ , while keeping the temperature and deviatoric stress constant, and the steady-state creep rates corresponding to  $P_1$  and  $P_2$  are measured. Using this method  $V_d$  is given by

$$V_d = - \frac{kT}{P_2 - P_1} \ln \frac{\dot{\epsilon}_2 G_2^m D_0^m a_1}{\dot{\epsilon}_1 G_1^m D_0^m a_2} \quad (3)$$

or

$$V_d = V_c - \frac{kT}{P_2 - P_1} \ln \frac{G_2^m D_0^m a_1}{G_1^m D_0^m a_2} \quad (4)$$

where

$$V_c = - \frac{kT}{P_2 - P_1} \ln \frac{\dot{\epsilon}_2}{\dot{\epsilon}_1} \quad (5)$$

is the apparent activation volume from creep measurements.