

volume viscosity (or dilatational viscosity)

A quantity ζ which enters into equations at any point where the flow involves a change in volume, i.e. is dilatational. If the deformation is purely dilatational, the average of three normal stress components is:

$$\sigma = \frac{1}{3} (\sigma_{xx} + \sigma_{yy} + \sigma_{zz}) = -p + \zeta \left(\frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} + \frac{\partial v_z}{\partial z} \right)$$

where p is the hydrostatic pressure at the point considered in the absence of motion.

Source:

PAC, 1979, 51, 1213 (*Manual of symbols and terminology for physicochemical quantities and units. Appendix II: Definitions, terminology and symbols in colloid and surface chemistry. Part 1.13. Selected definitions, terminology and symbols for rheological properties*) on page 1216