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shear viscosity

For a Newtonian fluid, the shear viscosity is often termed simply viscosity since in most situations it is the only one considered. It relates the shear components of stress and those of rate of strain at a point in the fluid by:

$$\sigma_{xy} = \sigma_{yx} = \eta \left(\frac{\partial v_x}{\partial y} + \frac{\partial v_y}{\partial x} \right) = 2 \eta \dot{\gamma}_{yx}$$

where $\dot{\gamma}_{yx}$, the shear component of rate of strain is defined as follows:

$$\dot{\gamma}_{yx} = \frac{1}{2} \left(\frac{\partial v_x}{\partial y} + \frac{\partial v_y}{\partial x} \right)$$

Corresponding relations hold for σ_{xz} and σ_{yz}; σ_{xy} is the component of stress acting in the y-direction on a plate normal to the x-axis; v_x, v_y, v_z are the components of velocity.
See also: shear dependent viscosity

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

