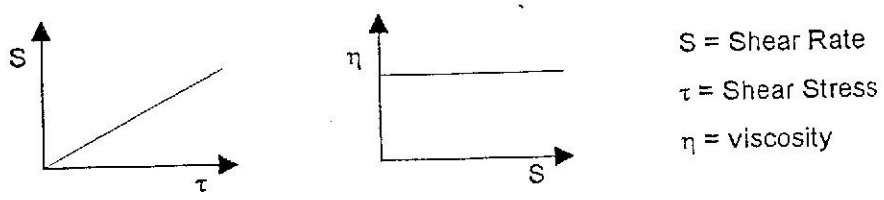
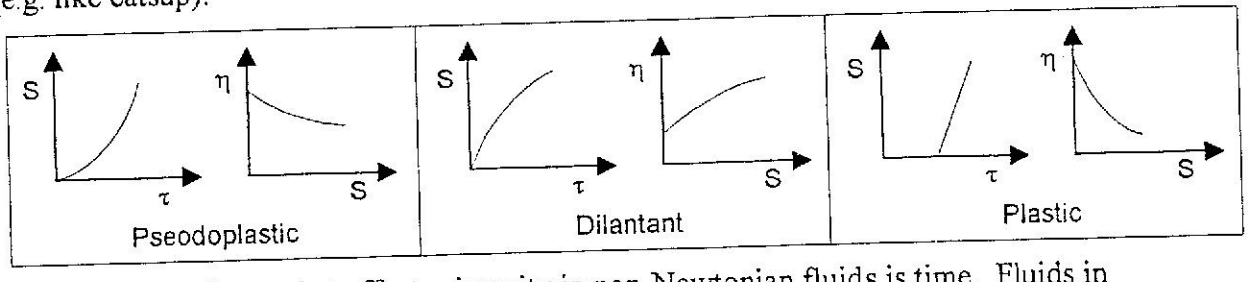
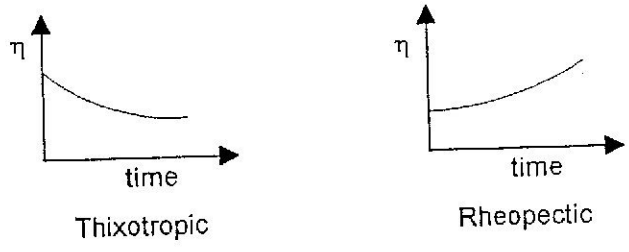
Since Newton thought viscosity was constant (independent of the shear rate), fluids that exhibit this property are classified as "Newtonian". Typical Newtonian fluids include water, thin motor oil, gasoline, and air. The characteristics of a Newtonian fluid are graphed as follows:



Non-Newtonian fluids are broadly defined as those in which the shear stress is not directly proportional to the deformation rate (shear rate). The most common types of non-Newtonian fluids include pseodoplastic, which have decreasing viscosity as the shear rate increases; dilantant, which have increasing viscosity as the shear rate increases, and plastic, which require a certain amount of force to be applied before any flow is induced (e.g. like catsup).



Another factor that affects viscosity in non-Newtonian fluids is time. Fluids in which the viscosity decreases with time are known as thixotropic, and are more common than those in which viscosity increases with time - known as rheopectic. Both thixotrophy and rheopexy may occur with any of the previously discussed flow behaviors.