岩石矿物的固体状态蠕变是地球内部主要的变形力学机制，位错和扩散蠕变。从经验流体定律得到有效黏度formulation。

扩散蠕变是经典主要的方式的在低压区results from
the diffusion of atoms through the interior (Herring–Nabarro creep) and along the
boundaries (Coble creep) of crystalline grains subjected to stresses. As a result of
this diffusion, grain deformation leads to bulk rock deformation。它是线性的，应变率由应力决定，是线性的。

where Adiff is a proportionality coefficient which is independent of stress, but depends on grain size, pressure, temperature, oxygen and water fugacity。

位错蠕变主要在高压区，migration of dislocations (imperfections in the
crystalline lattice structure)

两种位错方式都可以从经验数据中来刻度，从一个简单的关系：