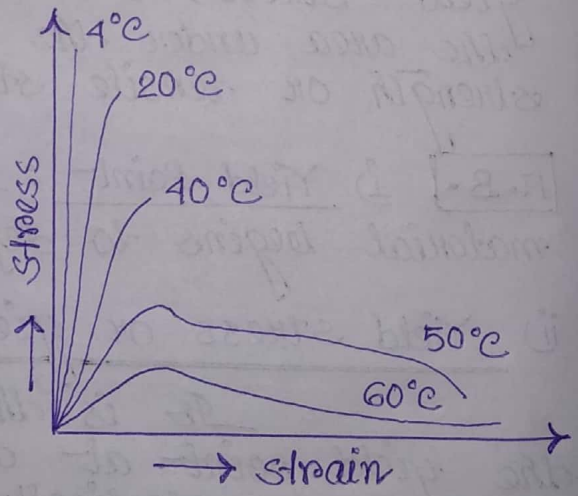
the yield point, a material deform elastically. Once the yield point is passed, some fraction of deformation will be permanent. and is known as plastic deformation.

iii) Elongation at yield :

It is the ratio between increased length and initial length at the yield point.

The soft and weak polymer is characterized by a low modulus of elasticity, low yield (stress) point. The hard and brittle class is characterized by a high modulus of elasticity, a poorly defined yield point a little elongation before fat failure. However, the soft and tough polymers have a low modulus of elasticity, high elongation and a well-defined yield-point. The stretch after the yield point, so toughness or ultimate strength is greater than for the hard and brittle polymers. The hard and tough (strong) polymers show moderate elongation before the yield point followed by non-recoverable elongation. The adjacent figure contains stress-strain behavior of a PMMA material. Below the T_g, the material behaves as a stiff (শক্ত), brittle solid similar to hard & brittle polymer. With increasing temp^n, the PMMA gives gains enough thermal energy, to allow for the some segmental mobility. The isotactic PMMA has $T_g \approx 45°C$ while syndiotactic PMMA has $T_g \approx 130°C$. The material in the figure is largely isotactic with a T_g of about $50°C - 60°C$



N.B.

- Tensile strength (Pascals) = force required to break sample (N) / cross-sectional area (m^2)

- Elastic modulus or Tensile modulus or modulus of elasticity = Ratio of the applied stress to the strain it produces within the region where relationship between the stress and strain is linear.

- Pulling stress or strain = The deformation of a test sample caused by application of specific loads. It is the change in length (ΔL) of the test sample divided by original length (L).

- Elastic strain = Recoverable strain or elongation.

- Flexural strength or Cross-breaking strength = A measure of bending strength or stiffness of a test-bar specimen used as a sample beam and load is applied to its centre.