

Homework #4: Polymer physics

Due date: 2008/12/04

1. Suppose the free volume of a polymer is

$$f = -\frac{B}{12 \ln((T - T_n)/T_n)} \quad (\text{where } T_n \text{ is constant})$$

If a polymer has a glass transition temperature of 0 °C and a viscosity of 1.03×10^{14} Pa·s at glass transition temperature, what will its viscosity be at 40 °C? (Suppose T_n of this polymer is 263.6K)

2. We have learned three main theory of glass transition temperature. Describe assumption, principle, advantage and disadvantage of each theory.