

Introduction to Macromolecular Physics

Prof. Dr. I. Sokolov

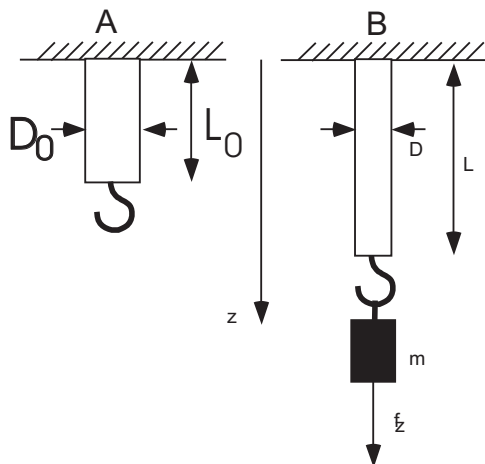
Homework 5

Rubber Elasticity

A cylindrical piece of rubber is glued with one side on a ceiling and a hook is mounted on the free end. The dimensions of the rubber are given by L_0 for the length and D_0 for the diameter (case A of Figure below). The ambient temperature is T_1 .

1. What is the diameter D of the piece if a load of mass m is attached to the hook (case B of Fig. below)?
2. How does the length L change if the temperature is raised to $T_2 = 2 \cdot T_1$?

Assume that the elongation is small, i.e. $\lambda \approx 1$.



- *Don't forget, we have an examination on Thursday, February 8.* If you have whatever questions regarding the material of the course, they can be discussed during our meeting on Tuesday, Feb. 6.