ABSTRACT:

The measurement of viscosity is a useful tool in finding the molecular weight of polymers. In this experiment the measurement of viscosity at different concentrations is used to find the molecular weight of a polymer.

TEXT REFERENCE:


OTHER REFERENCES:

GENERAL DESCRIPTION AND THEORY:

The viscosity of a solution can be easily measured using a device such as an Ostwald viscometer. If one uses a standard such as water, the viscosity of an unknown liquid can be found from the ratio: \( n_1/n_2 = d_1t_1/d_2t_2 \), where \( d \) represents the density, \( n \) the viscosity and \( t \) the time for the liquid to flow through the viscometer for each of the two liquids. From this information, a specific viscosity may be obtained: \( n-n_0/n_0 \), where \( n_0 \) is the viscosity of the solvent. When the specific viscosity divided by the concentration is plotted versus the concentration and extrapolated to zero, the intrinsic viscosity is obtained. The intrinsic viscosity can be directly related to the molecular weight through two constants, \( K \) and \( a \), which are specific for solvents and polymer.

EQUIPMENT:

Thermostat at 25 deg C, Ostwald viscometer, pipets, timer.

CHEMICALS:

Toluene, polystyrene.

LABORATORY PROCEDURE:

Follow the procedure described by Sime.

CALCULATIONS:

The calculations are those described by Sime.

LITERATURE VALUES: