

The application of laser light scattering system for determination of polymer molecular weight

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Abstrak

ABSTRACT

The molecular weight of Polymer material can be determined using optical system by measuring the intensity of scattered light at low angle light scattering and its the incident beam, based on Rayleigh scattering have developed by Debye has known as Static Light Scattering.

To carry out this measurement, an optical system was constructed using a HeNe laser light with a certain intensity, and the light passed through a polymer solution and its scattered light were then detected using a photo multiplier.

To obtain the experimental results, the set-up was tested using a polymer standard, which has been already known its average molecular weight. In this experiment were used the polymer standard with average molecular weight 35000, 110000 and 200000. Furthermore, this optical experiment set-up constant, were used for determining the average molecular weight of the polymer samples.

In this experiment a linear curve relation between the optical Rayleigh polymer and the polymer concentrations was constructed, and by extrapolating this linear curve up to zero concentration the molecular weight of polymer can be determined.

From the laboratory test we got that the experimental set up could be used for the measurement of polymer, which has the molecular weight larger than 35000 to 200000, with tolerance 4 percent.