

Fast determination of average Molecular Weight

- A simple way to characterize polymers using viscosity measurements -



Introduction

There are many different techniques that can be used to determine the molecular weight of polymers, such as size exclusion chromatography or time-of-flight mass spectrometry, these methods give precise results, however they are often costly, time consuming and require an operator with special training. FLUIDICAM^{RHEO} offers a way to quickly and easily determine the molecular weight of many different types of polymers by viscosity measurements.

KEY BENEFITS

- FAST & SIMPLE
- USER-FRIENDLY
- EFFECTIVE

Reminder on the technique

FLUIDICAM^{RHEO} uses a co-flow microfluidic principle to measure viscosity. The sample and a reference solution are simultaneously introduced into the microfluidic channel (typically 2.2mm X 150µm) with controlled flow rates. This results in a laminar flow where the interface position between sample and reference relates the viscosity ratio and flow rates.

Images acquired during the measurement allow the software to calculate the position of the interface and directly plot an interactive flow curve.

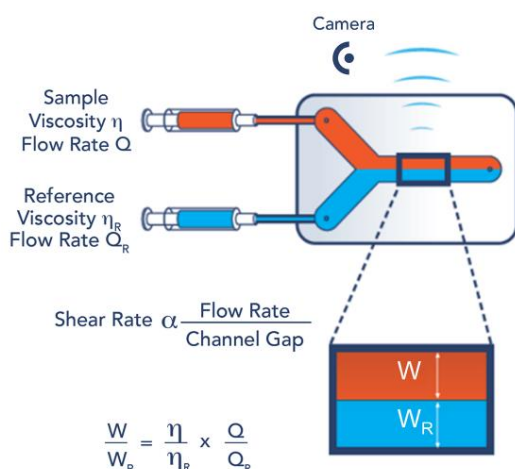
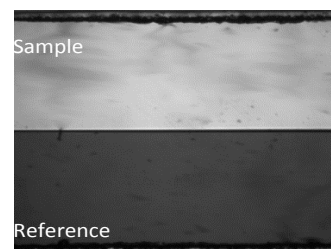


Fig. 1: Fluidicam measuring principle



Experimental conditions

The polymer was dissolved in a solvent of choice at a concentration inferior to its C^* , the polymer must be 100% soluble in this solvent. Several dilutions were made to vary the concentration, and therefore vary the viscosity. The viscosity of each solution was measured with FLUIDICAM^{RHEO} and the intrinsic viscosity was calculated using 2 different methods. This value of intrinsic viscosity was then used to calculate the average M_w .