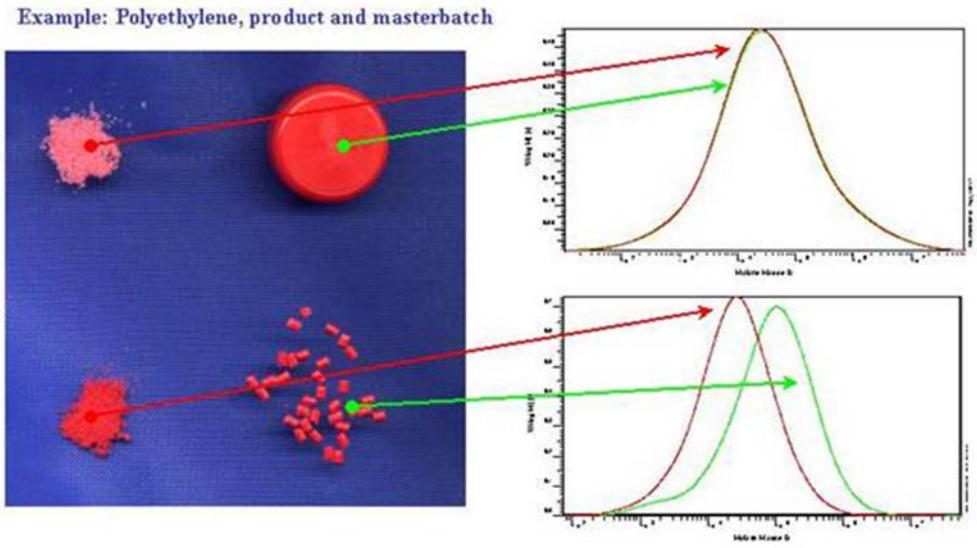
Characterization of polymers

The analysis of polymers is executed with the aid of gel permeability chromatography.

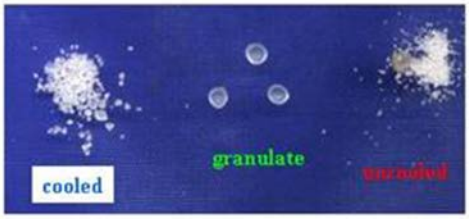
This process is a kind of liquid chromatography similar to the HPLC. Due to the size of the molecules the separation takes place in the solution. Depending on the detector, the average value of the molar mass, polydispersity and the viscosity of the polymer sample are determined.
Here suitable sample preparation is important in order to dissolve the polymers. The degradation - the destruction of the characteristics of the material - has to be avoided though.

Utilizing the Variable-Speed Rotor Mill
An ideal solution for the sample preparation is the **Variable-Speed-Rotor Mill PULVERISETTE 14 *classic line*.** Here a final fineness of < 80 µm is achieved. An embrittlement of the polymers with liquid nitrogen or the grinding while adding dry ice avoid the degradation.

The following graphics illustrate the analysis of PE (polyethylene) and PP (polypropylene):

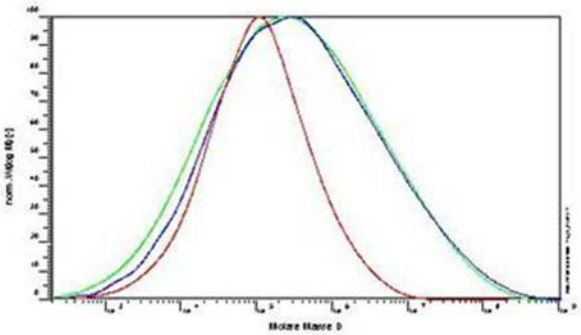


Fritsch GmbH • Milling and Sizing
Industriestrasse 8 • 55743 Idar-Oberstein • Germany
Phone+49 67 84 70 0
info@fritsch.de • www.fritsch.de



Example:
ultrahighmolecular
polypropylene

dissolved:
granulate: 1,5 h at 170°C
powder: 0,5 h at 160°C



Author: Dipl.-Phys. Wolfgang Simon,
Fritsch GmbH, E-Mail: **info@fritsch.de**