

Measurement and evaluation of elongational viscosity of selected biomaterials

Bachelor thesis abstract

Hana Šustková

20.5.2011

This thesis analyzes the elongational viscosity of the biomaterials. The basic concepts related to the issue of measurement of shear and elongational viscosity of melts in particular focusing on the SER rheometer, which was used in the experiment, were presented.

With SER rheometer elongational viscosity of BioFlex samples of BioFlex, PA6 and their mixtures at temperatures of 225°C and 235°C for ten Hencky different strain rates from 0.1 to 10 s⁻¹ were studied. In the experiment rectangular specimens prepared for different content of Bioflex and Polyamide PA6 were used.

Based on the data presented in this thesis some features of the internal structure of used biomaterial, and its possible practical applications, further and qualitative changes in its properties in the mixture were described.

It was shown that the linear viscoelastic response of BioFlex is two orders of magnitude below in comparison to the response of PA6 and in the temperature range the linear viscoelastic response does not change. It is shown that in mixtures with BioFlex and PA6 the BioFlex shows a significant proportion of the linear viscosity range - and at low concentrations of BioFlex in comparison to PA6 the viscosity remains very low and virtually identical to the pure BioFlex. BioFlex also greatly increases the strain hardening of the sample, therefore, there is majority influence of probably stronger BioFlex chains. The work also shows that the PA6 mixed with Bioflex influences the derivative of linear viscosity.

Short videos taken during the experiment were also included into this thesis.