

OPPONENT'S REVIEW

of PhD. dissertation thesis

Author: Ing. Bc. Jiří Drábek

Title: Applied Rheology for Production of Polymeric Nanofibers

Opponent: prof. Ing. Pavol Alexy, PhD.

The submitted thesis is focused on the rheological characterisation of PP at high shear rates with respect to molecular structure of polymer. The work has a range of 162 pages of text, tables and images, including 173 references and 4 published papers. The literature sources are well chosen and appropriately used. The work is appropriately divided into separate chapters, written in clear manner. The main results are given in the form of published papers.

Results of the thesis are based on own experimental work and calculations of various standard as well as modified rheological models. Namely 5-parameter modified models describe experimental data very well. Based on obtained results it was concluded among the other, that in the second Newtonian region no entanglements between the PP chains exist and viscosity reflects only friction between highly oriented macromolecular chains. Author mentioned that viscosity in the second Newtonian region depends on molecular weight linearly.

All obtained results are logically discussed in detail with confrontation to known knowledge from literature. The dissertation thesis is of a very high level of quality (in its content as well as the formal processing). I have only one question connected to the influence of molecular weight on the melt viscosity.

1. In the first part of work the influence of degradation process on rheological parameters was described and discussed. The degradation process was realised by the long-time thermal exposition. The effect of changes in molecular structure on rheological behaviour is evident and detailed discussed by author. In the second part of work, where the high shear rates were applied for rheological measurements, no discussion about the changes in the architecture of macromolecules was mentioned. What do you think about influence of high shear stresses (rates) on changes in molecular structure of tested PP? Is it possible, that high shear viscosity can be influenced by degradation process caused by degradation induced by high shear? Was the GPS measurement done also after high shear rheological measurements?

The presented dissertation thesis of **Ing. Bc. Jiří Drábek** represents valuable results with high level quality of interpretation. The objectives of the dissertation were fulfilled and the work meets the criteria for a doctoral study. Based on this, after a successful defence, I suggest **Ing. Bc. Jiří Drábek** to be awarded with the title

„philosophiae doctor“, PhD.

Bratislava, 4.11.2018

prof. Ing. Pavol Alexy, PhD.