ABSTRACT

The thesis "The effect of mixture composition and pre-treatment parameters on the efficiency of the cellulose laurate esterification reaction", describes the cellulose esterification reaction in the reactive extrusion process in an ionic liquid and co-solvent environment, which results in the synthesis of cellulose laurate.

The aim was to achieve effective cellulose esterification reaction with a mixture pre-treatment via 3-minute reactive extrusion. The main objectives were to develop mixture pre-treatment methodology and optimize mixture composition. The following materials were used: microcrystalline a-cellulose, vinyl laurate, ionic liquid [mTBNH][OAc], dimethyl sulfoxide, and super-base mTBN.

The influence of the reaction mixture composition and the pre-treatment conditions on the efficiency of cellulose esterification reaction was analysed. Current research has tested and examined the effects such as pre-treatment time and temperature, reaction mixture composition, catalyst addition, application of US-treatment, and VL amount in mixture.

This study has identified key parameters for the successful production of cellulose laurate in 3-minute extrusion. The author claims that this work has good opportunities for further development and potential implementation on a production line, because cellulose laurate is a promising alternative material to traditional petroleum-based plastics in many areas.

The thesis is in English and contains overall 70 pages of text, 6 main chapters, 40 figures, 9 tables.

Keywords: cellulose, esterification, ionic liquids, reactive extrusion, master's thesis.