

A biorefinery approach to the separation and application of the products of lignocellulose pyrolysis

Project contract No. 1.1.1.2/16/I/001

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Operational Programme “Growth and Employment”

Activity 1.1.1.2 “Post-doctoral Research Aid”

Project progress over-view from October 1st 2021 to December 31st 2021

Implementation of WP1 “Comprehensive analysis of pyrolysis condensates obtained from lignocellulose ” and WP2 “Fractionation of pyrolysis condensates” continues; WP3 “Analysis of the pyrolysis product fractions and purification of specific chemicals”.

In the 6th quarter the Validation protocol has been written about four analytical methods for the determination of specific chemicals in pyrolysis products. The Validation protocol is for use in the LSIWC Liquid Chromatography Centre as an informative material about the basic sugar, furan and phenol determination methods with various systems available at the Liquid Chromatography Centre. In the appendix of the document instructions about the use of *Empower 3* and *Clarity* software has been included.

During mobility to the Kaunas University of Technology development of levoglucosan and its isomer 1,6-anhydro- β -D-glucofuranose determination methods was carried out. The obtained results are used in a scientific article to be published at the beginning of the next quarter. Additionally, fermentation experiments were tried during this mobility, to plan for the fermentation experiments in the next mobility period.

Ion exchange resin was used to preparatively separate a concentrated pyrolysis condensate (paste), producing >100 g of an anhydrosugar fraction. Work is also being continued to selectively desorb phenols from the sorbent after collecting the anhydrosugar fraction. Different conditions have been tried for desorption (water at different temperatures or in ultrasound, organic solvents with and without additives). The separated anhydrosugars and purified levoglucosan will be used in the fermentation experiments in the Kaunas University of Technologies.

Leading partner – Latvian State Institute of Wood Chemistry

Cooperation partner – Kaunas University of Technology, the Department of Food Science and Technology

Project duration: 36 months.

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