

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

Project contract No. 1.1.1.2/16/I/001

Project number: 1.1.1.2/VIAA/3/19/388

Operational Programme “Growth and Employment”

Activity 1.1.1.2 “Post-doctoral Research Aid”

Project progress over-view from October 1 2022 to December 31 2022

Implementation of WP3 “Analysis of the pyrolysis product fractions and purification of specific chemicals” continues.

During the 10th quarter, results related to solid phase separation of birch wood-based pyrolysis condensates with anion exchange resins and various solvent combinations have been summarised. By separating the condensate in a column, information about the efficiency and solvent consumption has been obtained. The birch wood-based pyrolysis condensate was separated into two fractions – 14% went into the first one, and 76% into the second – acidified – fraction, but the remaining 10% of phenols were recovered by washing the resin with a sodium hydroxide solution. According to UHPLC-UV analysis the dominant compounds in the second fraction were vanillic acid and syringic acid. The results have been described in a manuscript entitled “Solid phase extraction of the aromatic by-products obtained by fast pyrolysis of pre-treated lignocellulose”, which has been submitted for publication in *Chemical Engineering and Technologies*. At the same time, investigations about the hydrolysis of various pyrolysis condensates have been carried out, to develop the valorisation and application in fermentation processes of the pyrolytic sugars.

During mobility an enterprise *Nova Pangaea Technologies* in UK was visited to obtain better understanding about industrial biomass conversion processes. The visit was a good foundation for further cooperation within this project (a joint publication will be submitted), and in more distant future.

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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