

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 July 1 2022 to September 30 2022

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

During the 9th quarter the experiments of phenol desorption from the anion exchange resin after anhydrosugar separation were repeated. It was observed, that solid phase extraction had a good repeatability regardless of the anhydrosugar (levoglucosan) and aromatic compound ratio in the samples. As a reference a mixture of standard chemicals – levoglucosan, furfural, vanillin, vanillic acid – was separated in the anion exchange resin column, and the trend was confirmed, that in the water fraction anhydrosugars and furans are eluted, which, after changing the eluent to methanol and then methanol/water/acetic acid mixture, are followed by vanillin and vanillic acid. For the UHPLC-UV-MS analysis, based on standard compounds, a library of UV spectra and prominent ions in single quadrupole MS was compiled. In the pyrolysis products obtained from birch wood, vanillin, vanillic acid, syringic acid, syringaldehyde, guaiacol and syringol were the dominant aromatic compounds.

During mobility participation in a summer school at Kaunas Technology University was a good support for writing a new project proposal. In the middle of the quarter the results of the WP3 were presented at an international conference CHISA 2022 “26th International Congress of Chemical and Process Engineering” as a poster “Separation and characterisation of the aromatic by-products obtained by fast pyrolysis of pre-treated lignocellulose”.

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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