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 April 1 2023 to June 30 2023

The last quarter of the project was devoted to writing a technological instruction "Down-stream processing of pre-treated lignocellulose pyrolysis liquids" during WP4 "Development of a universal scheme for the sequential separation of valuable products from pyrolysis condensates according to biorefinery principles". The instruction provided guidelines for the separation of pyrolysis products to obtain high purity levoglucosan, as well as a phenol fraction, and a mixture of hydrolysable sugar derivatives, applicable as a substrate for fermentation. Furthermore, several mobility activites were carried out during the last quarter, disseminating the scientific results of the project, popularising the Latvian State Institute of Wood Chemistry, and ensuring contact for future cooperation, for example, in *Horizon Europe*, projects. In the last month of the project, the scientific results were presented at several conferences, throughout the project the results have been published in five peer-reviewed papers[i],[ii],[iii],[iv],[v], and another manuscript [vi] has been sublitted for publication in the follow-up period.

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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[ii] Meile, K., Dobele, G., Iljina, N., Zhurinsh, A., Jurkjane, V. Lignocellulose pyrolysis by-products as an underestimated source of chemicals: separation and characterisation, Biomass Conversion and Biorefinery, 2023, 13(7), pp. 5709–5720 https://doi.org/10.1007/s13399-021-01540-8

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[iv] Marrot, L., Meile, K., Zouari, M., Sandak, A., Herrera, R. Characterization of the Compounds Released in the Gaseous Waste Stream during the Slow Pyrolysis of Hemp (Cannabis sativa L.), Molecules, 2022, 27(9), 2794 https://doi.org/10.3390/molecules27092794

[v] Meile, K., Volkova, E., Jermolajeva, A., Zhurinsh, A. Antioxidant Activity of Lignocellulose Pyrolysis By-Products after Levoglucosan Separation, Key Engineering Materials, 2022, 933, pp. 169–175 https://doi.org/10.4028/p-sfqrru

[vi] Meile, K., Godina, D., Hindle, N., Zhurinsh, A. Characterization and separation of value-added products from birch wood pyrolysis liquids: anhydrosugars and phenols, submitted to Biomass Conversion and Biorefinery