WeBIOPATR 2021

The Eighth International WEBIOPATR
Workshop & Conference
Particulate Matter: Research and Management

Abstracts of Keynote Invited Lectures and Contributed Papers

Milena Jovašević-Stojanović,

Alena Bartoňová,

Miloš Davidović and Simon Smith, Eds

Vinča Institute of Nuclear Sciences

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ABSTRACTS OF KEYNOTE INVITED LECTURES AND CONTRIBUTED PAPERS

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Milena Jovašević-Stojanović

Alena Bartoňová

Miloš Davidović

Simon Smith

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11.9 DETERMINATION OF LEVOGLUCOSANE AND ITS ISOMERS IN AMBIENT AIR PM USING GAS CHROMATOGRAPHY WITH MASS SELECTIVE DETECTOR IN THE BELGRADE URBAN AREA

Cvetković A. (1), Matijević D. (1), Šoštarić A. (1), Živković M. (2),Vuković N. (1), Dikanović S. (1), Anić T. (1), Radusin K. (1)

Public Health Institute of Belgrade, Serbia, (2), Vinča Institute of Nuclear Sciences, University of Belgrade Serbia

anka.filipovic@zdravlje.org.rs

The aim of many studies has focused on the chemical characterization of airborne particulate matter (PM), not only because of health effects, but also because it allows source apportionment to be carried out (Padoan et al., 2020). Identification and quantification of the source emissions is important in order to reduce particulate pollution. A significant source of atmospheric aerosols all over the world is biomass burning. Pyrolysis of cellulose at temperatures above 300 °C produces levoglucosan and its isomers mannosan and galactosan. The major constituent is levoglucosan and it is very important to estimate the fraction of aerosols attributed to biomass combustion from the PM/Levoglucosan emission ratio (Bhattarai et al., 2019). Levoglucosan has proved to be a suitable tracer for biomass combustion.

The method in this paper which was used for the determination of levoglucosan, mannosan, galactosan and other anhydrous monosaccharides in samples of suspended particles in ambient air is the GC / MS technique after methanol extraction and derivatization with BSTFA (N,O-bis(trimethylsilyl) trifluoroacetamide). After sampling, 47 mm-diameter filters were extracted with methanol in an ultrasonic bath at room temperature. The extract was transferred to an evaporation vessel through a 0.45 μm filter. The methanol extraction was repeated, and the extracts collected and evaporated down to 0.25 ml. Before GC-MS analysis, it was necessary to perform derivatization. The entire extract was transferred to a vial together with a solution of D-sorbitol (injection standard) and the internal standard of sedoheptulose anhydride monohydrate. The was evaporated extract in a stream of nitrogen to dryness. and derivatized with 100 μL of BSTFA and 900 μL of pyridine. The vial was closed and allowed to stand for two hours at room temperature before analysis by GC. The obtained results have shown that average response for levoglucosane was 10.66%, uncertainty was 14.14% and LOD 0.002 ng/m3.

Key words: PM; source apportionment, biomass burning

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