

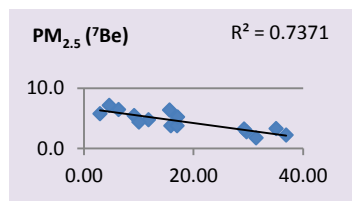
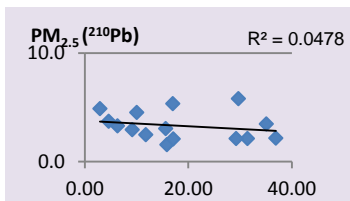
CORRELATION BETWEEN AIRBORNE RADIONUCLIDES AND SELECTED TRACE ELEMENTS IN SUBURBAN ENVIRONMENT

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Adverse health effects of ionizing radiation raise a concern related to the inhalable radionuclides in the ambient air, but the additional risk comes from the coarse, fine and ultrafine atmospheric particulate matter with complex predominantly non-radioactive trace elements.

➤ Assessment of these two pollutant categories usually includes different approaches and research methodologies although both obey to similar processes and influences in the atmospheric environment. Physical-chemical characteristics and correlations of Pb-210, Be-7 and Cs-137 activity concentrations in total suspended particles and selected trace elements concentrations in the fine fraction (PM_{2.5}) of atmospheric particulate matter, observed at the suburban monitoring station have been a subject of this study.



➤ Results have shown moderate correlation of fine APT PM_{2.5} with both cosmogenic Be-7 and naturally occurring Pb-210 (Rn-222 descendant, from U-238 radioactive series) Fig1.

Trace element	Correlation with PM _{2.5} , R ²
Al	0.3635
Ti	0.011
Ca	0.062
Cu	0.064
Fe	0.1296
Mn	0.4925
V	0.5941
Zn	0.7241
Ni	0.6215
As	0.532
S	0.4215
Br	0.6057
Cl	0.8846
K	0.8859
Cr	0.7947
Pb	0.7766

➤ Sampling and analysis of radionuclides and PM_{2.5} and trace elements was done at the same monitoring station but following different protocols and analytical techniques so comparison the correlations and mid-term trends have been analyzed and discussed based on the calculated values and statistics, radionuclides origin in the lower atmosphere, nuclear data, antropogenic air pollution factors, meteorological and precipitation data, etc.

➤ The observed correlations and meteorological parameters have shown a dominantly natural origin of these elements, but the industrial emissions might still contribute in some extent.

➤ Differences between elemental lead and radionuclide Pb-210 concentration allow us to distinguish shares coming from local soil and from the antropogenic activities in the investigated environments. This study has shown a capacity of naturally occurring radionuclides to be the tracers of processes in lower layers of atmosphere or the indicators of pollution origin, especially in boundary urban areas.