

EG0800101

APPLICATION OF NAA AND AAS IN ENVIRONMENTAL RESEARCH IN SLOVAKIA

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The concentrations of 41 chemical elements (heavy metals, rare earths, and actinides) were determined in atmospheric aerosol using nuclear and related analytical techniques. The sampling location was in Bratislava (Slovak Republic). The main goal of this study is the quantification of the atmospheric pollution and its trend. The elemental content in filters was measured using instrumental neutron activation analysis (NAA) at IBR-2 reactor in JINR Dubna and by atomic absorption spectrometry (AAS) in Bratislava. The obtained results confirm the decreasing trend of pollution by most of the heavy metals in Bratislava atmosphere, and they are compared with the contents of pollutants in atmosphere of other cities, including Cairo. We determined also the composition of clear filter materials.

Results on atmospheric deposition of heavy metals and other trace elements in the whole territory Slovakia using the moss biomonitoring technique are presented, too. The level of the elements found in the bryophytes reflects the relative atmospheric deposition loads of the elements at the investigated sites. Factor analysis was applied to determine possible sources of trace element deposition in the Slovakian moss. The marginal hot spots were revealed near nonferrous ores processing and factories and dumps of stone chips. The trans-boundary contamination by Hg through dry and wet deposition from Czech Republic and Polish is evident in the bordering territory in the north-west part of Slovakia (The Small Black Triangle), known for metallurgical works, coal processing and chemical industries.