^{129}I as atmospheric tracer

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Iodine is an important element in oceanic, atmospheric and terrestrial systems. Atmosphere is one of the most important compartments for natural and anthropogenic changes and provides rapid response to disequilibrium. Iodine is transferred between compartments on different time scales and in different chemical forms (species). However, the dominant transfer pathway is either through the atmosphere as reactive gases (e.g. I_2, CH_2I_2, CH_2ICl, CH_3I), bound to aerosols or in the aqueous phase (i.e. rain, rivers, lakes and oceans).

^{129}I has received increased attention in recent years as unique atmospheric and environmental tracer. ^{129}I is a long lived ($T_{1/2}$ = 15.7 Ma) radionuclide whose concentration in environment has been elevated by several orders of magnitude, mainly by emission from reprocessing plants [1]. However in spite of environmental relevance, there is still little knowledge about temporal variability of the ^{129}I anthropogenic fallout over Europe. One of the main goals of this study is to trace transport path of ^{129}I released from reprocessing plants in atmosphere by measuring its concentration.

This study deals with temporal changes of iodine isotopes (^{127}I and ^{129}I) in aerosols collected within two years in Vienna, Austria (202 m a. s. l). The data shows isotopic ratios of the order of 10^{-8} to 10^{-7}. The predominant basis for the higher ratios in the aerosols appears to be upcurrent sources of ^{129}I from nuclear fuel reprocessing plant at Sellafield. Apart from this, short term variability of ^{129}I concentrations was associated with air mass transfer and wind pattern.

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Mineral composition of particulate matter in human lung samples from Upper Silesia (Poland) – Preliminary results

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The aim of this study is to compare the mineral composition of airborne particles to mineral composition of particles inhaled by humans who lived in highly urbanized and industrialized region of Upper Silesia (S Poland). The characterization of mineral particles in samples of lung tissues of 40 subjects by TEM and ASEM revealed the presence of quartz, aluminosilicates including feldspars, Ca carbonates, iron oxides, Ca sulphates, and kaolinite as major components.

All of those minerals are major mineral constituents of dust particles in Upper Silesia in addition to soot. Some of them may serve as tracers of the source of inhaled particles. For instance, barite particles in lung tissues may be related to the abundant airborne barite resulted from the combustion of the uniquelly Ba-rich Silesian coal. The lung tissues lack of Pb-particles, which are common in airborne soot particles. Their fast dissolution in lung fluids is a possible explanation of their absence in lung tissues.

Additionally, Ca-phosphates (perhaps of the apatite group) and zinc oxide were observed on rare occasions in lung tissues.

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