

Activity size distribution of ^7Be in aerosol samples collected in Bratislava, Slovakia

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^7Be is a relatively short-lived (half-life of 53.3 days) cosmogenic radionuclide produced in the stratosphere and troposphere. The produced ^7Be is attached to fine aerosol particles and is transported within and between individual atmospheric layers and by wet or dry deposition it is transported into terrestrial and marine environment. That makes ^7Be an excellent tracer of these processes and it is extensively used to study vertical transport in the atmosphere, horizontal transport of air masses and changes in the cosmic radiation flux and solar activity.

At the Comenius University in Bratislava, aerosol sampling and gamma spectrometry of the collected samples have been done continuously for several decades. However, no study of particle size distribution and its association with ^7Be activity has been done before. A low-pressure-drop cascade impactor with high flow rate was used to determine the size distribution of the particulate matter in the sampled air with cutpoints of 10, 2.5, 1.4, 0.77, 0.44 and 0.25 μm . The maximum of ^7Be activity was observed in the 0.44 - 0.77 μm range and the activity median aerodynamic diameter (AMAD) was evaluated to be $0.50 \pm 0.5 \mu\text{m}$.