

TITLE

Unattached radon progeny as an experimental tool for dosimetry of nanoaerosols: Proposed method and research strategy

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In this paper we discuss a proposed method for dose assessment of nanoaerosols, i.e., particles in the range of 1–100nm. Nanometer aerosols are particles of extremely small sizes. A radioactive marker for these particles must be even smaller in size in order not to distort experimental results. We propose as an experimental tool the smallest radioactive nanoparticle, 1nm, called unattached activity of radon progeny. These particles form naturally by radioactive decay of the inert radioactive gas radon.

The goal in these human experiments is to measure the local lung deposition of nanoaerosols by measurement of the gamma-activity of radon progeny. After inhalation of the mixture of monodispersed aerosols in the nanometer range, labeled with 1-nm unattached activity of radon progeny, which build up naturally due to radioactive decay of inert radioactive gas radon, the distribution of the gamma-activity in the lung is measured.

Because each locally deposited nanoparticle is associated with measured gamma-quantum or -activity, the gamma-activity itself quantitatively represent locally deposited nanoparticles, i.e., local nanoparticle dose. After inhalation the gamma-activity distribution in the lung represents local distribution of nanoparticles, since these particles are radiolabeled with radon progeny.

Biography

At present time Lev Solomon Ruzer, working as a visiting researcher in the Indoor Environment Department, Environment Energy Technologies Division Lawrence Berkeley National Laboratory, USA. I earned all my degrees and titles in the former USSR: Candidate of physic mathematical sciences (equivalent to PhD) in Moscow Engineering-Physical Institute (MEPHI) in 1961; Doctor of Technical Sciences in the Institute of Physical-Technical and Radio technical Measurements (VNIIFTRI) 1971; The title of Professor in 1977 (VNIIFTRI). I am the author of 3 books, Editor of 1 book and now preparing the second edition of this book (Taylor & Francis). I have teaching experience for 8 years. I received the gold and silver medals.