

EFFECT OF IONIZING RADIATION ON FILTRATION EFFICIENCY OF MATERIALS USED IN RESPIRATORY PROTECTION ON THE EXAMPLE OF RADON

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The most common hazards associated with radiation include the hazards due to the occurrence of radioactive aerosols the main component of which are radon degradation products with short half-life. The acceptable doses of ionizing radiation that can be absorbed by various living organisms including humans have been established. There are however no definite requirements concerning RPE in this respect. There is also no described testing methodology which could be applied for assessment of such protective devices. The primary aim of the research presented in this paper was to develop the methodology of tests and criteria of assessment making it possible to assess appropriately the protective parameters of the filtering elements used for respiratory protection against aerosols containing radioactive isotopes. In the course of the study it was established that the value of radioactive aerosol penetration through filtering materials exceeds the results obtained for standard NaCl aerosol. The presence of radioactive aerosols in air was demonstrated to cause a decrease of filtration efficacy in materials whose filtration mechanism is based on electrostatic interactions. The above indicates that the filter-based protective equipment currently used at worksites with radiation hazards present does not guarantee maintenance of the protective parameters crucial for the user safety. The methods currently applied for assessment of RPE have proven to be insufficient for the assessment and selection of appropriate filtering respirators for protection against radiation hazards.