

Radon gas in the environment: A terrific mate or horrific rival?

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Abstract

The noble gas radon (^{222}Rn), found ubiquitously in our environment, is a colorless, odorless and tasteless entity. It is a dangerous alpha particle (^4He) emitting gas and behaves both as an excellent friend and as a worst enemy of mankind. It is generated on account of radioactive breakdown of its instantaneous parent Radium (^{226}Ra) in the Uranium (^{238}U) decay series found in trace amount in soils, rocks and water.

In living places and underground excavations its highly charged solid daughters attach themselves to air borne dust particles, which are subsequently dumped in the pulmonary tract after inhalation, thus creating a threat of lung cancer to human health. Similarly, ingestion of radon bearing drinking water can also cause a threat of gastrointestinal cancer. Several thousand people throughout the World expose themselves yearly to radon dose in the facilities ranging from rural old mines, to expensive sanatoriums and clinics in the hope to get rid of their body pains. Radon baths are characteristically used for high blood pressure, joint pains and arteriosclerosis of lower margins, and inhalation treatment is frequently managed at speleotherapy centers for conditions such as bronchial asthma and chronic bronchitis.

Therefore, on one hand radon gas is considered as a serious health risk to mine workers and common people living in their homes, while, on other hand it is a very valuable tool in a wide variety of human applications including therapeutic usage in medical sciences and utilization as an exploratory tool in earth sciences. As a geological tool radon monitoring technique can be used in mineral exploration, prediction of future earthquakes, study of active geological faults and geothermal energy sources. Fault zones have been recognized with fairly precise accuracy throughout the World with this technique. The tool can also successfully be used in hydrologic research, when studying the interactions between streams, groundwater and rivers. It has also found limited use in search for geothermal energy sources.