

Radon induced surface contaminations in low background experiments

Wednesday, 10 April 2013 16:25 (20 minutes)

In neutrinoless double beta decay and dark matter searches, one of the main issues is to increase the experimental sensitivity through careful material selection and production, minimizing the background contributions. In order to achieve the required, extremely low, counting rates, very stringent requirements must be fulfilled in terms of bulk material radio-purity. As the experimental sensitivity increases, the bulk impurities in the detector components decrease, and surface contaminations start to play an increasingly significant role.

In fully active detectors, like cryogenic particle detectors, surface contaminations are a critical issue (as shown by the CUORICINO experiment). Rn-222 is by far the most intense source of airborne radioactivity, and if a radio-pure material is exposed to environment where the Radon concentration is not minimized, Pb-210 and Po-210 contaminations can occur. The mechanisms and the dynamics of Radon-induced surface contaminations are reviewed, and specific solutions to prevent and to reject the induced background are presented.

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Session Classification: Session 4 - Fabrication methods and surface contamination control

Track Classification: Fabrication methods and surface contamination control