Contribution ID: **67** Type: **not specified**

Removal of long-lived Rn-222 daughters from metal surfaces

Removal of long-lived Rn-222 daughters from metal surfaces

Surface contamination with long-lived daughters of Rn-222 is of great interest for experiments looking for rare events. These include the detection of low energy solar neutrinos, searches for neutrino-less double beta decay or searches or dark matter. Decays of Pb-210, Bi-210 and
finally Po-210 may contribute significantly to the experiments'background, especially when they appear close or directly in the active
volumes.
Measurements of natural surface contamination with Po-210 of aluminum, stainless steel, titanium and copper surfaces will be presented. Measurements were performed with an ultra-low background, large-areas alpha spectrometer. The instrument allows to study the surface contamination down to about 1 mBq/m2. The assay showed no detectable surface contamination for surfaces covered with protective foils,
while unprotected metals exhibited significant polonium activities.
Naturally contaminated metal surfaces were also etched and electro-polished to study the effect of Po removal. Electro-polishing was always quite effective and provided the Po activity reduction factor of about 20, what was consistent with our previous studies performed for samples artificially loaded with high Po activity. Standard etching procedures are in general less effective, especially for copper for which hardly any reduction has been observed. This is probably due to the fact that Po initially removed from the surface (sub-surface) layer is re-deposited. In
order to avoid this effect a fast multi-step process has been developed where one longer bath is replaced by several subsequent and short runs always with fresh etchant. Application of the new procedure to various copper samples resulted in Po activity reduction by more than two orders of magnitude, down to the detection limit of the instrument (1 mBq/m2).

Author: ZUZEL, Grzegorz (Jagiellonian University in Krakow)

Presenter: ZUZEL, Grzegorz (Jagiellonian University in Krakow)