



Contribution ID: 379

Type: Poster

^{90}Y Cherenkov radiation measurement for ^{90}Sr determination

Monday, 12 May 2014 17:15 (1h 30m)

Isotope of strontium ^{90}Sr (one of the nuclear fission products with half-life 28.9 years) is well known for its biochemical similarity with calcium and possible consequent incorporation into human body. Main risk presents its daughter product ^{90}Y (half-life 64.1 hours), which is a high energy β -emitter ($E_{\beta, \text{max}} = 2.28 \text{ MeV}$). That is why the development of fast and effective method of ^{90}Sr determination or monitoring is ongoing last 50 years and it is still one of the important topics. Hence, current demands call for advanced and less time-consuming methods for ^{90}Sr determination. Main aim of this research was focused on the ^{90}Sr determination in simulant solutions of environmental samples without the necessity to wait for the equilibrium with ^{90}Y . This approach is crucial for the development of rapid method of ^{90}Sr determination in environmental samples. Activity of ^{90}Sr was measured through its daughter product ^{90}Y using Cherenkov counting on HIDEX 300 SL and TRIATHLER (both Hidex Oy, Finland) liquid scintillation counters. Two type of samples were used for measurement. The Cherenkov radiation was measured from samples containing equilibrium amount of ^{90}Y or from samples where ^{90}Y growth is observed. A set of solutions with different diffraction indexes and set with different wavelength shifters for increasing Cherenkov radiation yield/detection was studied. It was find out that composition of the solution strongly affects measured background and hence further optimization of the sample content and parameters measurement is necessary. The activity obtained via Cherenkov counting were compared and verified using liquid scintillation counting of ^{90}Sr , similar comparison was done between Triathler (1-photomultiplier) and HIDEX 300 SL (3-photomultipliers, TDCR) measurements.

Primary author: Mr NEUFUSS, Soběslav (CTU in Prague)

Co-author: Dr NĚMEC, Mojmír (CTU i Prague)

Presenter: Mr NEUFUSS, Soběslav (CTU in Prague)

Session Classification: Poster Session - Nuclear Analytical Methods

Track Classification: Nuclear Analytical Methods