

PRODUCTION OF SPIKED VEGETATION SAMPLES CONTAINING GAMMA-EMITTING RADIONUCLIDES TO PARTICIPATE IN PROFICIENCY TESTING PROGRAMS

Friday, 30 September 2016 10:01 (0:01)

Content

The production of environmental samples such as soil, sediment, water and vegetation with radionuclides for intercomparison tests is a very important contribution to environmental monitoring. Laboratories that carry out such monitoring need to demonstrate that their results are reliable. The National Laboratory for Ionizing Radiation Metrology (LNMRI) by means of National Intercomparison Program (PNI) produces and distributes environmental samples containing radionuclides used to check the environmental measurement laboratory performances. This work demonstrates the feasibility of producing vegetation (grass) samples containing ^{60}Co , ^{65}Zn , ^{134}Cs , and ^{137}Cs by the spiked sample method for the PNI. The preparation and the statistical tests followed 34 and 35 ISO Guiderecommendations. The grass samples were dried, ground and passed through a sieve of $250\ \mu\text{m}$. 500 g of vegetation was treated in each procedure. Samples were treated by two different procedures: homogenizing of the radioactive solution containing vegetation by hand and drying in an oven; and homogenizing of the radioactive solution containing the vegetation in a rotatory evaporator and drying in an oven. The reference values for activity concentration of the radionuclides in the grass had a range of 593 Bq/kg to 683 Bq/kg. After gamma spectrometry analysis the results of both procedures were compared as accuracy, uncertainty, homogeneity and stability. The accuracy, uncertainty and short time stability from both methods were similar but the homogeneity test of the evaporation method was not approved for the radionuclides ^{60}Co and ^{134}Cs . Both procedures of preparation showed similar results, with values close to the reference. The main differentiating factor was the homogeneity, in which the agitation proved to be more homogeneous than the evaporation procedure. The homogenization of the solution into the distillation flask from the rotary evaporator was not effective because it does not convey the agitation of the solution for the whole container. Based on comparisons between procedures was chosen the manual agitation procedure for the grass sample. The accuracy of the procedure had a range between -1.1 and 5.1% and the uncertainty between 0.6 and 6.2 %. This result show is the procedure chosen for the production of spiked grass samples for PNI.

About the Presenter

My name is Poliana Santos de Souza, I'm brazilian, I live in Rio de Janeiro, Brazil. I graduated from University Unigranrio in chemistry. I finished the master's degree in radiation protection and Dosimetry in the area of metrology, Institute of radiation protection and Dosimetry. My professional goal is an opportunity in a chemical or nuclear, so that I can put into practice the knowledge acquired and obtain new knowledge. At work, I try to be considerate. And I have easily to work in group, if necessary.

Primary author(s) : Ms. DE SOUZA, Poliana (IRD)

Presenter(s) : Ms. DE SOUZA, Poliana (IRD)

Session Classification : Quality

Track Classification : Quality