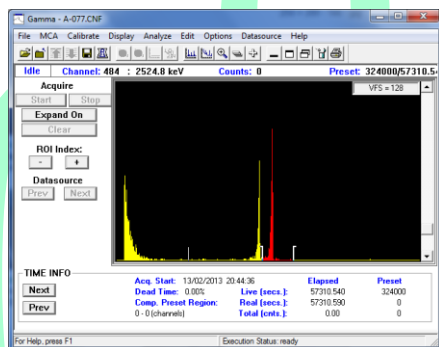


Introduction

The Radiochemistry Laboratory of the Life Sciences Division conducts tests for identification and measurement of radioactive contamination in various sample matrices such as air, food, vegetation, water and soil by with using Alpha Spectroscopy and Gross Alpha Beta counting technique. The main types of radionuclide that are investigated in these tests are U-238, U-235, U-234, Th-232, Th-230, Th-228, Am-241, Pu-240+239, Pu-238 and Po-210.



Alpha radiation spectrum

Radiochemical protocols and procedures facilitating the process of quality assured measurement of alpha and beta emitting radionuclide identification was established in 2004 and we have come a long way improving the testing capabilities with latest technologies related to radiochemical analysis. The laboratory regularly participates in proficiency tests organized by International Atomic Energy Authority (IAEA) and inter-comparison analysis for alpha emitting radionuclides and gross alpha radioactivity for quality assurance, delivering an optimal service to our clients both commercial and R&D.

Alpha Spectroscopy.

Alpha spectroscopy is one of the major Nuclear Analytical Techniques. It uses detection of alpha radiation for identification and quantification of radionuclides in samples. Alpha radiation is a type of particulate ionizing radiation emitted by very heavy nuclides such as Uranium, Thorium and Polonium. This radiation has specific energy that is characteristic of the radionuclide. This permits for identification and quantification of natural radionuclides such as Uranium, Thorium or anthropogenic radionuclides such as Plutonium, Americium, Neptunium, etc. They are major radioactive contaminants found in the environment, fatal to the human body if ingested.



8 chamber alpha spectrometer

The Life Sciences Division houses the latest technology from CANBERRA + Mirion Technologies, Inc. Alpha Analyst alpha spectrometer from Mirion, can measure 8 samples simultaneously, with Passivated Implanted Planar Silicon (PIPS) detectors. Along with Apex Alpha, the latest nuclear

analytical software by CANBERRA, this system can deliver efficient and accurate results for commercial as well as R&D purposes.

Gross Alpha-Beta Measuring.

CANBERRA iSolo gross alpha-beta counting system is the latest addition to our nuclear analytical services. It can perform measurement on gross effects from alpha and beta radiation in air, soil and water samples. The system is a portable, gasless PIPS detector based system to measure alpha and beta emitters such as transuranic elements (Plutonium, Americium etc.) and fission products, with the advantage of discriminating between radon and thorn and their progeny.



CANBERRA iSolo system

The system is ideal for radioactive contamination measurement of air with using air filter analysis, soil and water analysis after radiochemical preparation. The laboratory is ready for delivering commercial services for contamination evaluation of drinking water and bottled water as per Central Environmental Authority (CEA) recommendations in the near future with quality assurance through IAEA proficiency tests and by obtaining relevant ISO accreditation.



A Chamber of alpha spectrometer, detector and sample holder



PIPS detectors

General Requirements

Sample quantities required for the analysis:

Sample Type	Quantity
Soil, Sediment	100 g
Water	2 L
Flora, Fauna (Biological samples)	2-5 g (ash) or 100g

Analysis performed in our Laboratory

- Measurement of Gross Alpha and Beta in mineral water
- Measurement of Gross Alpha and Beta in environmental samples
- Measurement of Gross Alpha and Beta in air particulates and filters
- Measurement of Po-210 in environmental samples
- Measurement of U-234, U-235 and U-238 in various samples
- Measurement of Th-228, Th-230 and Th-232 in various samples
- Measurement of Am-241 in various samples
- Measurement of Pu-238 and Pu-239+240 in various samples

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Sri Lanka Atomic Energy Board (SLAEB)

Life Sciences Division

Nuclear Analytical Techniques

Alpha and Beta Radiochemical Analysis

