



Contribution ID: 106

Type: Oral

EVALUATION OF RADIOLOGICAL HAZARDS DUE TO NATURAL RADIOACTIVITY IN SOIL SAMPLES COLLECTED IN AND AROUND SOME GOLD MINING AREAS OF THE MAYO-KEBBI REGION IN CHAD WITH STATISTICAL ANALYSES.

Wednesday, 18 May 2022 11:30 (45 minutes)

In this work, a HPGe detector in a low-background setup was used to determine the activity concentrations of ^{238}U , ^{232}Th and ^{40}K in soil samples collected in and around some gold mining areas of the Mayo-Kebbi region in Chad. Subsequently, the radiological risks due to these natural radionuclides were also assessed. The range of activity concentrations of ^{238}U , ^{232}Th and ^{40}K varied respectively from 1.42 to 430.88 Bq/kg, 1.19 to 56.61 Bq/kg and 27.38 to 840.51 Bq/kg with respective average values of 29.67 Bq/kg, 11.98 Bq/kg and 234.43 Bq/kg. The highest value of ^{238}U , ^{232}Th and ^{40}K concentrations were found in soil sample collected at gold mining area of Zabili. Correlation studies between ^{238}U versus ^{232}Th , ^{40}K versus ^{238}U , and ^{40}K versus ^{232}Th were performed. The results showed a good correlation between the pairs (^{238}U , ^{232}Th) however a weak correlation was observed between the pairs (^{238}U , ^{40}K) and (^{232}Th , ^{40}K). In order to investigate the statistical variation of the data and its implications on environmental exposure, the hierarchical binary cluster tree was implemented. The mean annual effective dose of the soil samples collected in the studied area was found to be 0.18 mSv/y. The calculated mean values of the external hazard index (H_{ex}) and the internal hazard index (H_{in}) of the study area were 0.26, 0.26, respectively. These values are lower than unity. Therefore, mining activities in Mayo-kebbi region do not present any radiological hazard to the general public.

Primary author: BONGUE, Daniel (Centre for Atomic Molecular Physics and Quantum Optics (CEPAMOQ) - Faculty of Science - University of Douala - Cameroon)

Co-author: Mr PENABEI, Samafou

Presenters: BONGUE, Daniel (Centre for Atomic Molecular Physics and Quantum Optics (CEPAMOQ) - Faculty of Science - University of Douala - Cameroon); Mr PENABEI, Samafou

Session Classification: Environmental Applications