



Ain Shams University
Faculty of Girls for Arts
Science and Education
Physics Department

Environmental Nuclear Studies of Natural and Manmade Radioactivity at Nugrus and Sikeit Areas, South Eastern Desert. Egypt.

Thesis

**Submitted in the partial Fulfillment
for M. Sc. Degree in Physics**

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**Faculty of Girls for Art, Science and Education,
Ain Shams University**

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Abstract

This work aims to study an area which is characterized by abnormal radioactivity and has several archeological sites (Sikait Temple) along historic trade routes linking the Red Sea with the Nile Valley. Emerald mining is a wide spread activity since ancient times at Sikait-Nugrus area.

The concentration of the natural radionuclides are measured in all the rocks samples to find the specific radioactivity of ^{238}U -series, ^{232}Th -series and ^{40}K by using two techniques (a high resolution gamma ray spectrometer based on coaxial HpGe detector and shielded by cylinders of lead, copper and cadmium and NaI (TI) detector). The analysis of data is completed by computerized multichannel analyzer with high level software programs. The radionuclides concentration in the different samples is compared with the exempt levels proposed by the International Atomic Energy Agency (IAEA) which is of scientific interest to health physics.

It was found that the specific activities of ^{238}U , ^{232}Th , and ^{40}K in the samples from Wadi Sikeit are higher than that from Wadi Nugrus.

The results obtained are higher than the permissible international radioactivity levels. The area under investigation is classified of high-level natural uranium concentration, so it can be considered as an area of uranium resources potentiality and uranium production field area used with economic value in different purpose. This may be discussed by the hydrothermal solutions, which played the most important rule in the uranium enrichment as well as the alteration of rocks.

Abstract

At Wadi Sikeit most the samples are in disequilibrium state (eU/Ra) >1 (Uranium gain) except two samples has (eU/Ra) = 1 (equilibrium). Only in one sample the ratio is less than one (Uranium loss).

At Wadi Nugrus all the samples show disequilibrium state with eU/Ra ratios >1 (Uranium gain) except one sample shows eU/Ra ratios < 1 (Uranium loss).

For that reason, strong safety considerations are recommended for protection of the working personal in the Nugrus area.

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