



AIN SHAMS UNIVERSITY
FACULTY OF EDUCATION
DEPARTMENT OF PHYSICS

Study of the specific radioactivity for volcanic and rock samples using different nuclear techniques

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By

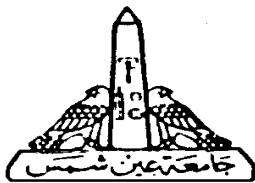
Nasser Abdullah Saghir Al-Galal
M.Sc. of teacher preparation in physics

Supervised By

Prof. Dr. A.H. Ashry
Prof. Dr. W. M. Arafa

Prof. Dr. H. M. El-Samman
Dr. M. A. Abou-leila

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Ain Shams University
Faculty of Education
Physics Department

Title of thesis

Study of the specific radioactivity for volcanic and rock samples using different nuclear techniques

Name of Student: Nasser Abdullah Saghir Al-Galal

Supervised By

Approved

1-Prof. Dr. A.H.ASHRY

Prof. of Nuclear Physics
Faculty of Education
Ain Shams University.

2- Prof. Dr. HUSSEIN MAHMOUD EL-SAMMAN

Prof. of Nuclear Physics
Faculty of Science
Minoufiya University.

3-Prof. Dr. WAFAA MAHMOUD ARAFA

Prof. of Nuclear Physics
Faculty of Women
Ain Shams University.

4- Dr. MOHAMED ABOU-LEILA

Ass. Prof.of Nuclear physics
Faculty of Education
Ain Shams University.

2016

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DEDICATION

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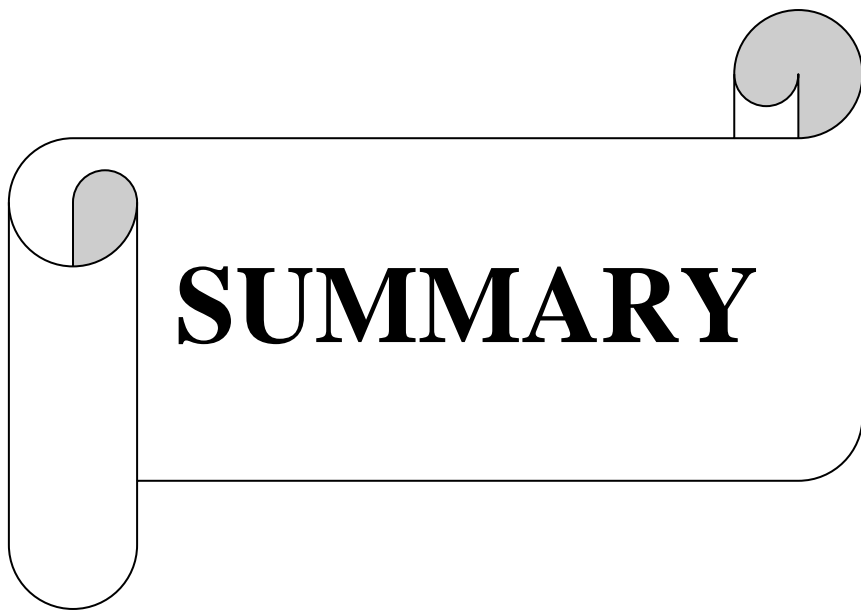
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Summary

This work aims to measure the natural radioactivity levels, radon exhalation rate and mass exhalation rate in volcanic and rock samples in some Yemen areas.

In the present study the radioactivity levels of the collected samples using high purity Germanium detector spectrometers has been determined. The measurement of radon concentration, radon exhalation rate and mass exhalation rate of radon (^{222}Rn) have been done using the cup-technique making use nuclear track detectors (CR-39).

In order to achieve this aim, the thesis is composed of four chapters:

Chapter one:

It consists of an introduction, natural and artificial sources of radiation, terrestrial radiation, gamma-ray interactions in matter and theoretical aspects.

Chapter two:

It contains a historical review of the work.

Chapter three:

This chapter contains a detailed identification of the areas under investigation, samples collection, samples preparation and the different techniques used in the present measurements. The activity concentration of ^{238}U , ^{232}Th , and ^{40}K are also measured using active

techniques. Finally, radon exhalation rates are also determined using cup-technique

Chapter four:

This chapter contains the results obtained throughout the present work. The activity concentration of terrestrial radionuclides ^{238}U , ^{232}Th and ^{40}K have been determined using high purity Germanium detector spectrometers. Evaluation of radiological hazard as well as radon concentration, radon exhalation rate and mass exhalation rate of ^{222}Rn have been obtained using cup technique. The obtained values were compared to the international values