

Natural Radioactivity along Red Sea Coastline, Egypt

Radiological Impact & Heavy Metals of Sediment Samples, Measurement

Hesham Mahmoud Hamed Mohammed



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by

Hesham Mahmoud Hamed Mohammed

Physics Department, Faculty of Science,
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About this Monograph

This monograph is a thesis of the author approved by the Department of Physics, Faculty of Science, Al-Azhar University, Egypt as a partial fulfilment For M. Sc. Degree in Physics in 2015. The original thesis title was "Natural Radioactivity Measurement and Radiological Impacts of Sediment Samples along Red Sea Coastline, Egypt" written under the guidance of following supervisors-

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Contents

Preface.....	v
Acknowledgement.....	vii
Brief Introduction to Radioactivity	1
1 Radioactivity in Environment.....	1
2 Radioactivity Sources in Environment.....	2
2.1 Natural Sources.....	2
2.1.1 Primordial Radionuclides.....	2
2.1.2 Cosmic Radiation.....	3
2.1.3 Cosmogenic Radionuclides	3
2.2 Man-made (Anthropogenic) Sources	3
3 Radioactive Decay	4
4 Radioactive Equilibrium.....	6
4.1 Secular Equilibrium.....	6
4.2 Transient Equilibrium.....	7
4.3 No Equilibrium.....	9
5 Interaction of Gamma Rays with Matter.....	9
5.1 Photoelectric Absorption.....	10
5.2 Compton Scattering	11
5.3 Pair Production.....	13
6 Radiation Detection	13
6.1 Counting System for Gamma-ray Spectrometry	14
7 Biological Effects of Radiation.....	15
7.1 Exposure.....	15
7.2 Absorbed Dose.....	15
7.3 Equivalent and Effective Dose	16
Environmental Conditions of Red Sea.....	19
1 Red Sea Morphology.....	19
2 Geological Setting.....	21
3 Meteorology.....	22
3.1 Climate	22
3.2 Air Temperature	23
3.3 Winds.....	23
3.4 Rain Fall	23

Contents

3.5	Humidity	23
4	Oceanography	24
4.1	Water Temperature	24
4.2	Salinity	25
4.3	Hydrogen Ion Concentration (pH)	25
4.4	Currents.....	26
4.5	Tide.....	26
4.6	The Mean Sea Level.....	26
5	Description of the Studied Areas.....	26
5.1	Quseir City:.....	28
5.2	Safaga City:	31
5.3	Hurghada City:.....	32
5.4	Ras Ghareb City:.....	35
	Experimental Procedure.....	41
1	Samples Collection:	41
2	Samples Preparation:.....	41
2.1	Radiometry Analysis.....	42
2.2	Mechanical (Granulometric) Analysis	42
2.3	Geochemical Analysis.....	42
3	Instrumentation	43
3.1	Activity Measurements	43
3.2	Location of Samples.....	43
3.3	Geochemical Instruments.....	44
3.4	Statistical Analysis.....	44
3.5	Graphical Software.....	44
4	Gamma Spectrometry.....	44
5	Sodium Iodide Detector (NaI(Tl)).....	45
6	Energy Calibration:.....	46
7	Efficiency Calibration:	46
8	The Uncertainty of Efficiency:.....	48
9	Determination of Detection Limits	49
10	Measuring Activity of NORM Nuclides	49
11	Uncertainty of Activity:	50
12	Background Measurement	51
13	Radiological Hazards Indices:.....	51
13.1	Radium Equivalent Dose (R_{eq})	51
13.2	Absorbed Gamma Dose Rate (D).....	52

Contents

13.3	Hazard indices:.....	52
13.4	Annual Effective Dose:.....	52
13.5	Gamma index (I_γ).....	53
13.6	Excess Lifetime Cancer Risk (ELCR):.....	53
13.7	Annual Gonadal Dose Equivalent (AGDE).....	53
	Results and Discussion.....	56
1	Activity Concentrations:.....	56
1.1	Radionuclide Activity Concentrations in Qusier City.	56
1.1.1	Correlation and Concentration Ratio of Natural Radionuclides in Sediment Samples from Qusier City.....	61
1.2	Radionuclide Activity Concentrations in Safaga City.....	63
1.2.1	Correlation and Concentration Ratio of Natural Radionuclides in Sediment Samples from Safaga City.....	66
1.3	Radionuclide Activity Concentrations in Hurghada City.....	68
1.3.1	Correlation and Concentration Ratio of Natural Radionuclides in Sediment Samples from Hurghada City.....	72
1.4	Radionuclide Activity Concentrations in Gharib City.....	74
1.4.1	Correlation and Concentration Ratio of Natural Radionuclides in Sediment Samples from Gharib City.....	78
2	Radiological hazards indices:.....	80
2.1	Radiological Characterization of Qusier Sediment Samples.....	80
2.1.1	Radium Equivalent Activities (R_{aeq}).....	80
2.1.2	Absorbed Gamma Dose Rate (D).....	83
2.1.3	Internal Radiation Hazard (H_{in}).....	84
2.1.4	External Radiation Hazard (H_{ex}).....	84
2.1.5	Annual effective dose.....	86
2.1.6	Gamma index (I_γ).....	87
2.1.7	Excess Lifetime Cancer Risk (ELCR).....	89
2.1.8	Annual Gonadal Dose Equivalent (AGDE).....	89
2.2	Radiological Characterization of Safaga Sediment Samples.....	91
2.2.1	Radium Equivalent Activities (R_{aeq}).....	91
2.2.2	Absorbed Gamma Dose Rate (D).....	93
2.2.3	Internal Radiation Hazard (H_{in}).....	94
2.2.4	External Radiation Hazard (H_{ex}).....	95
2.2.5	Annual Effective Dose.....	96
2.2.6	Gamma Index (I_γ).....	96

Contents

2.2.7	Excess lifetime cancer risk (ELCR)	98
2.2.8	Annual gonadal dose equivalent (AGDE)	99
2.3	Radiological Characterization of Hurghada Sediment Samples.....	100
2.3.1	Radium Equivalent Activities (Ra_{eq})	100
2.3.2	Absorbed gamma dose rate (D)	102
2.3.3	Internal radiation hazard (H_{in})	103
2.3.4	External radiation hazard (H_{ex}).....	104
2.3.5	Annual effective dose.....	105
2.3.6	Gamma index (I_{γ}).....	106
2.3.7	Excess lifetime cancer risk (ELCR)	108
2.3.8	Annual gonadal dose equivalent (AGDE).....	108
2.4	Radiological Characterization of Ras Gharib Sediment Samples.	110
2.4.1	Radium Equivalent Activities (Ra_{eq})	110
2.4.2	Absorbed gamma dose rate (D)	111
2.4.3	Internal radiation hazard (H_{in})	113
2.4.4	External radiation hazard (H_{ex}).....	114
2.4.5	Annual effective dose.....	115
2.4.6	Gamma index (I_{γ}).....	117
2.4.7	Excess lifetime cancer risk (ELCR)	118
2.4.8	Annual gonadal dose equivalent (AGDE).....	119
3	Geochemical characteristics OF MARINE SEDIMENTS.....	120
3.1	Sediment Texture	120
3.2	Carbonates (Carb.)	122
3.3	Total Organic Matter(TOM) And Organic Carbon(OC)	123
3.4	Heavy Metals Distribution.....	123
4	Conclusions	127
	References	129

Preface

The present study characterizes the radioactive components in marine sediments to understand the dynamics of radionuclides in natural ecosystems. This information also provides important information needed for assessment of public health risk from ingestion, inhalation, and external exposure. Studies and surveys of natural radiation and radioactivity in Upper Egypt conducted since 1990 included monitoring of the concentration of natural radionuclides in environmental samples. Eighty-four samples of sediment have been collected from Red Sea coastline. Samples collection was considered the locations throughout four cities (Quseir, Safaga, Hurghada and Ras Ghareb,) in Red sea governorate, Egypt, with an aim of evaluating the environmental radioactivity and radiation hazard.

The activity concentrations of ^{226}Ra , ^{232}Th and ^{40}K have been measured by NaI (TI) detector connected to Multichannel Analyzer (MCA), with Genie 2000 software from Canberra (USA). The present status of grain size analysis, total organic matter, organic carbon, carbonate and heavy metals were assessed to study its correlation with concentrations of ^{226}Ra , ^{232}Th and ^{40}K in sediment accumulation, to identify sediment source in the area, and to evaluate their concentrations with respect to anthropogenic activities and natural impact.

Also, the results of analysis for physical parameters (pH, Temp., salinity, TDS, and conductivity), of surface water samples are used as fingerprint to identify pollution sources, their amounts, and their effect on sediments and marine water in the areas under study to help managers to identify anthropogenic impacts, and better assessing the needs for remediation by detecting any changes, from the existing level expected with operation of future activity.

The resulting data will be used as reference information to assess any changes in the radioactive background level in the future. Further, it will help us to achieve two main objectives. The first is to measure the level and character of environmental natural occurring radioactive materials in the Red sea coastline. We started in establishing the radiological base-line data and we investigate the present radio-ecological impact of the non-nuclear industries occurrence in sediments samples to preserve and protect the coastal environment of the Red Sea.

Hesham Mahmoud Hamed Mohammed

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Hesham M.H. Zakaly



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