ELECTRONIC REQUIREMENTS FOR DETERMINATION OF HAZARDOUS AND RADIOACTIVE CONTAMINANT AND DOSE ASSESSMENT MODELING AROUND NUCLEAR INSTALLATIONS

By

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B.Sc. Engineering in Electronics, Zagazig University, 1986

M.Sc. in Environmental Science, Ain Shams University, 1998

A Thesis Submitted in Partial Fulfillment

Of

The Requirement for the Doctor of Philosophy

In

Environment Science

Department of Environmental Engineering

Institute of Environmental studies & Research

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ABSTRACT

The radioactive or hazardous wastes which disposed, after their treatment and conditioning in cement or polymer, inside a surface or underground repository. According to the change in metrological conditions, radioactive ions may release through soil layer and may contaminate underground water.

Several investigations were performed to study the electronic requirements for determination of hazardous and radioactive contaminant and dose assessment modeling around nuclear installations. Several investigations were determined; choice of a suitable site to construct nuclear installation and repository, monitoring, radioactive survey and soil analysis of the site, measuring of radioactivity in soil, determination of types of soil (sand, clay, gravel,…etc) under investigation up to certain depths, capacity of soil to fix toxic ions, treatment and disposal of radioactive, organic and hazardous wastes and methodology of toxic or radioactive ions released from repositories to underground water.

The mathematical formulation to determine water flow through porous media was performed based on, continuity of fluid, continuity of solid, motion of fluid according to Darcy's law equation of the state and law of consolidation of media. A proposed computer program was done and consisted of a main program, a section of data and many subroutines.

CONTENT

List of Figures ……. 7

List of Tables ……. 15

CHAPTER-1
INTRODUCTION 19

1.1. Aim of the Work ……. 22

1.2. Literature Review ……. 23

1.2.1. Survey of Radioactivity in the Environment ……. 24

1.2.2. Performance Assessment Methodology for Low-Level Radioactive Waste Disposal ……. 32

1.2.3. Release of Toxic Ions to the Environment ……. 37

1.2.4. Determination of Radioisotopes in Soil ……. 39

1.2.5. Treatment of Organic Wastes ……. 44

1.2.5.1. Treatment of organic wastes using clay ……. 44

1.2.5.2. Electrical decomposition of organic compound ……. 49

1.2.5.3. Electrochemical decomposition of organic compound ……. 52

1.2.5.4. Bio-absorption of organic compound ……. 53

CHAPTER-2
MATERIALS and METHODS 55

2.1. Equipments ……. 55

2.1.1. High Purity Germanium System ……. 55

2.1.2. Survey Meter ……. 57

2.1.3. Spectrophotometer ……. 57

2.1.4. pH Meter ……. 57

2.1.5. Balances ……. 57

2.1.6. Mixer ……..……..……...……..… 58
2.1.7. Electrochemical Cells ….…… 58
2.1.8. Computer ….……...…….…….. 58
2.2. Calibration ……..…….…..…….…….. 59
2.2.1. Monitoring Instruments ……..…...…….…..... 59
2.2.2. Germanium Detector ……..…….……... 60
2.3. Chemicals ……..…...……..… 62
2.4. Calculations ……..…….. 63
2.4.1. Arithmetic Mean ……..……...……. 63
2.4.2. Standard Deviation ……..……..……. 63
2.4.3. Standard Error …….…….…….…… 64
2.4.4. Calculations of the Physical Properties of Soil..... 65
2.4.4.1. Density ……...……...… 65
2.4.4.2. Water absorption …...…….…….…….. 65
2.4.4.3. Porosity ……..…….... 66
2.4.5. Mathematical Equations ……...……. 66
2.4.5.1. Dose equivalent ……..……..……..…….. 66
2.4.5.2. Dose assessment due to release of radioisotopes …..... 67
2.5. Methods ……...……...……... 67
2.5.1. Interaction between Clay and Some Ions ……... 67
2.5.1.1. Fixation of ions on clay ……..……...……..… 67
2.5.1.2. Fixation of phenol on clay …… 68
2.5.1.3. Electrical decomposition of phenol ……..……..……... 69
2.5.2. Preparation of Environmental Samples ……..……..… 69
2.6. Site Location ……..……..…..……..… 69
2.6.1. Disposal Site Location ……..…..……...… 70
2.6.2. Soil Investigations ……..……...…….. 71

2.7. Meteorological Investigation ……..…….... 71

2.7.1. Relative Humidity …….…….. 71

2.7.2. Rain ……...…….…… 73

CHAPTER-3

RESULTS and DISCUSSION 75

3.1. Background Radio-Survey of Studied Site ……..…..…. 75

3.2. Determination of Radioactivity in the Soil of the Studied Area …….…….……... 77

3.2.1. Determination of Radioactivity in the Soil of the Studied Area around the Reactor …….……..... 77

3.2.2. Dose Assessment Produced from Soil …….……..…..... 99

3.2.3. Determination of Radioactivity in Certain Materials found in the Studied Area ……..... 104

3.3. Dose Assessment Modeling Around Nuclear Installations …….……..……..…..…….. 117

3.3.1. Soil Investigations ……..…….……... 118

3.3.1.1. Experimental characterization of soil …..…..…….…..... 118

3.3.1.2. Soil layers ……..……. 118

3.3.1.3. Determination of soil size and penetration time of liquid through soil ……..……..… 124

3.3.1.4. Radiometric measurements of samples …….……..… 126

3.3.2. Electrochemical Treatment of Organic Wastes ……..... 127

3.3.2.1. Treatment of phenol using electrochemical cell composed of copper-copper electrodes …….…… 128

3.3.2.2. Interaction of organic compounds with clays ……..... 140

a. Fixation of phenol on kaolin clay …….……. 140

b. Release of phenol which fixed on kaolin clay …..…... 152

3.3.3. Fixation of Phenol on Cement ……..... 157
3.3.4. Fixation of Ce III and Co II on Kaolin Clay ……..... 158
3.3.5. Integrated Systems to Treat Phenol …….……...… 160
3.4. Requirements for Methodology Models …….…….. 164
3.4.1. Water Flow through Saturated - Unsaturated Porous Media …….. 164
3.4.2. Data Requirements for Ground Water Flow Modeling ….. 164
3.4.3. Data Requirements for Source - Term Modeling ……... 165
3.4.4. Procedure for Applying the Methodology …….. 165
3.5. The Performance Assessment Methodology to Determent the Released Waste to the Environment … 167
3.6. Mathematical Determination of Dose from Radioisotopes Released to the Environment ….……..... 170
3.6.1. The Governing Equations ……...…….……... 170
3.6.1.1. Continuity of fluid …….……..…… 170
3.6.1.2. Continuity of solid …….…….…… 170
3.6.1.3. Motion of fluid (Darcy's law) ……...…..... 171
3.6.1.4. Equation of the state ……..... 172
3.6.1.5. Law of consolidation of media ……..……... 172
Summary and Conclusion …….……...…….....… 181
Reference …….……..…..……..……... 193
Appendix (A) …….…..……..……..... 215
Arabic Summary ……..…….…….…….. 239

LIST OF FIGURES

Fig (2-1)	: Diagram of high purity germanium detector …..…..	56
Fig (2-2)	: The electrolytic Cell..……..……...….	59
Fig (2-3)	: Energy calibration curve of high purity germanium detector …….…….....	60
Fig (2-4)	: Efficiency calibrations curve of high purity germanium detector …….…….....	61
Fig (2-5)	: Location of soil samples taken from the studied site	70
Fig (2-6)	: Radioactive disposal sites at Inshas …….....	70
Fig (2-7)	: bore-holes site at the studied area …….…….	71
Fig (3-1)	: Gamma radiation level (μSv/h) at disposal site I and disposal site II …….....	76
Fig (3-2)	: Gamma spectra of background …….…….	80
Fig (3-3)	: Gamma spectra of soil samples collected form the four directions at 500 m measured from the center of the site at different uptake dates ……..……...	81
Fig (3-4)	: Gamma spectra of soil samples collected form the four directions at 1000 m measured from the center of the site at different uptake dates …….….....	89
Fig (3-5)	: Gamma spectra of soil samples collected form the four directions at 1500 m from the center of the site at different uptake dates ……..….....	92
Fig (3-6)	: Gamma spectra of soil samples collected form the four directions at 2000 m from the center of the site at different uptake dates …….…….....	94
Fig (3-7)	: Re-measuring done at 2006 of gamma spectra of soil samples collected from the four directions at	

500 m, 1000 m, 1500 m and 2000 m from the center of the site which measured at 2005 ……..... 97

Fig (3-8) : Activity (Bq/kg) found in soil samples collected form the four directions at 500 m, 1000 m, 1500 m and 2000 m from the center of the site at different uptake dates ……..... 100

Fig (3-9) : Re-measured activity (Bq/kg) done at 2006 found in soil samples collected form the four directions at 500 m, 1000 m, 1500 m and 2000 m from the center of the site which measured at 2005 ……..... 101

Fig (3-10) : Gamma spectra of soil samples collected form the four directions from first, second and closed third repositories and water tank site …….…… 102

Fig (3-11) : Gamma spectra of different material samples found in the studied area …….……. 106

Fig (3-12) : Gamma spectra of different material samples found in the studied area …….……. 107

Fig (3-13) : Gamma activities (Bq/kg) of each isotope found in material samples from the studied area ….…… 109

Fig (3-14) : Diagram of bore hole No. 1 and Gamma spectra of each soil layer taken form the bore hole …….……... 119

Fig (3-15) : Diagram of bore hole No. 2 and Gamma spectra of each soil layer taken form the bore hole …….……... 120

Fig (3-16) : Diagram of bore hole No. 3 and Gamma spectra of each soil layer taken form the bore hole …….……..... 121

Fig (3-17) : Diagram of bore hole No. 4 and Gamma spectra of each soil layer taken form the bore hole …….……... 122

Fig (3-18) : Diagram of bore hole No. 5 and Gamma spectra of each soil layer taken form the bore hole ……..... 123

Fig (3-19) : Absorption spectra of phenol at different electrolytic time (t_{min}) and at potential 5 volts. Electrolytic cell consisted of Cu-Cu electrodes in presence of 25 mg of phenol and certain amount of NaCl in one liter of distilled water …….…….. 130

Fig (3-20) : Effect of electrolytic time at a fixed 5 volts on phenol measured at λ = 269 nm using Cu-Cu electrodes in presence of 25 mg of phenol and certain amount of NaCl in one liter of distilled water 130

Fig (3-21) : Absorption spectra of phenol at different electrolytic time (t_{min}) and at potential 5 volts. Electrolytic cell consisted of Cu-Cu electrodes in presence of 50 mg of phenol and 0.5 g NaCl in one liter of distilled water …….. 131

Fig (3-22) : Effect of electrolytic time at a fixed 5 volts on phenol measured at λ = 269 nm using Cu-Cu electrodes in presence of 50 mg of phenol and 0.5 g NaCl in one liter of distilled water …….…….. 131

Fig (3-23) : Absorption spectra of phenol at different electrolytic time (t_{min}) and at 5 volts. Electrolytic cell consisted of Cu-Cu electrodes in presence of 25 mg of phenol and 0.5 g NaCl in one liter of distilled water ..…….. 133

Fig (3-24) : Effect of electrolytic time at a fixed 5 volts on phenol measured at λ = 269 nm using Cu-Cu electrodes in presence of 25 mg of phenol and 0.5 g

NaCl in one liter of distilled water ……..... 133

Fig (3-25) : Absorption spectra of phenol at different electrolytic time (t_{min}) and at known voltage. Electrolytic cell consisted of Cu-Cu electrodes in presence of different amount of phenol and certain amount of acetic acid in one liter of distilled water …… 134

Fig (3-26) : Effect of electrolytic time at known voltage on phenol measured at λ=269 nm using Cu-Cu electrodes in presence of different amount of both phenol and acetic acid in one liter of distilled water . 134

Fig (3-27) : Absorption spectra of phenol at different electrolytic time (t_{min}) and at known voltage. Electrolytic cell consisted of Cu-Cu electrodes in presence of 50 mg of phenol and certain amount of $NaNo_3$ or KNO_3 electrolyte in one liter of distilled water …..…….. 135

Fig (3-28) : Affect of electrolytic time at known voltage on phenol measured at λ = 269 nm using Cu-Cu electrodes in presence of 50 mg of phenol and certain amount of $NaNo_3$ or KNO_3 electrolyte in one liter of distilled water ……..……...……... 135

Fig (3-29) : Absorption spectra of phenol at different electrolytic time (t_{min}) and at known voltage. Electrolytic cell consisted of C-C electrodes in presence of 50 mg of phenol and certain amount of NaCl or $NaNO_3$ in one liter of distilled water …….……... 137

Fig (3-30) : Effect of electrolytic time at known voltage on phenol measured at λ = 269 nm using C–C

electrodes in presence of 50 mg of phenol and certain amount of NaCl or $NaNO_3$ in one liter of distilled water ……..…….…….. 137

Fig (3-31) : Absorption spectra of phenol at different electrolytic time (t_{min}) and at known voltage. Electrolytic cell consisted of different electrodes in presence of different amount of phenol and 0.5 g NaCl in one liter of distilled water ……..……... 138

Fig (3-32) : Effect of electrolytic time at known voltage on phenol measured at λ=269nm using different electrodes in presence of different amount of phenol and 0.5g NaCl in one liter of distilled water ……. 138

Fig (3-33) : Absorption spectra of phenol after 120 min contact time with 50 g of Kaolin clay at different pH values and different temperatures ……..……..... 141

Fig (3-34) : Uptake percent of phenol by 50 g of Kaolin clay at different pH values and different temperatures …..… 141

Fig (3-35) : Absorption spectra of phenol after 120 min contact time with 50 g of sand at different pH values ……... 142

Fig (3-36) : Uptake percent of phenol by 50 g of sand at different pH values ……..….. 142

Fig (3-37) : Absorption spectra of phenol after 120 min contact time and temperature equal to 28 ± 3 °C with different ratios of Kaolin clay and fine sand of grain size 0.5 mm at different pH values …… 145

Fig (3-38) : Uptake percent of phenol by Kaolin clay and fine sand of grain size 0.5 mm at different pH values and Temperature equal to 28 ± 3 °C …… 145

Fig (3-39) : Absorption spectra of phenol after 120 min contact time and temperature equal to 75 ± 5 °C with different ratios of Kaolin clay and fine sand of grain size 0.5 mm at different pH values ……..... 146
Fig (3-40) : Uptake percent of phenol by Kaolin clay and fine sand of grain size 0.5 mm at different pH values and Temperature equal to 75 ± 5 °C ……..…… 146
Fig (3-41) : Absorption spectra of phenol after 120 min contact time and temperature equal to 28 ± 3 °C with different ratios of Kaolin clay and gross sand of grain size 1.5 mm at different pH values ……...…… 147
Fig (3-42) : Uptake percent of phenol by Kaolin clay and gross sand of grain size 1.5 mm at different pH values and Temperature equal to 28 ± 3 °C ……..…… 147
Fig (3-43) : Absorption spectra of phenol after 120 min contact time and temperature equal to 75 ± 5 °C with different ratios of Kaolin clay and gross sand of grain size 1.5 mm at different pH values ……...…… 148
Fig (3-44) : Uptake percent of phenol by Kaolin clay and gross sand of grain size 1.5 mm at different pH values and Temperature equal to 75 ± 5 °C ……..…… 148
Fig (3-45) : Uptake percent of phenol by different ratios of kaolin clay and different size of sand at different pH values and different temperature ……..……. 149
Fig (3-46) : Absorption spectra of phenol released from 50 g of kaolin clay using 300 ml HCl 0.1N at different temperatures ……..……. 153
Fig (3-47) : Released percent of phenol from 50 g of Kaolin clay