

	Page
4.2.1.2. Siltstones.....	57
4.2.1.3. Alteration features of the least altered Hammamat sedimentary rocks.....	57
4.2.2. The altered mineralized Hammamat sedimentary rocks.....	57
4.2.2.1. The hematitized mineralized Hammamat sedimentary rocks.....	60
4.2.2.2. The bleached mineralized Hammamat sedimentary rocks.....	60
4.2.2.3. Uranium minerals and their association.....	61
4.3. Petrography of the Least Altered Granite of G. Gattar.....	63
4.4. Petrography of the Altered Granite of G. Gattar.....	76
 CHAPTER FIVE: GEOCHEMISTRY	
5.1. General Statement.....	81
5.2. Sampling and Methodology.....	81
5.3. Geochemistry of the Hammamat Sedimentary Rocks.....	83
5.3.1. The least altered Hammamat sedimentary rocks.....	83
5.3.1.1. Geochemical characteristics.....	83
5.3.1.2. Geochemical classification.....	88
5.3.1.3. Geochemical evidence of provenance.....	90
5.3.1.4. Tectonic setting.....	90
5.3.2. The altered mineralized Hammamat sedimentary rocks.....	93
5.3.2.1. Evaluation of the degree of alteration.....	93
5.3.2.2. Mass-balance analyses.....	93
5.3.2.2.1. Major oxides configuration.....	97
5.3.2.2.2. Trace elements configuration.....	99
5.4. Geochemistry of G. Gattar Granite.....	101
5.4.1. The least altered granite of G. Gattar.....	101
5.4.1.1. Geochemical characteristics.....	101
5.4.1.2. Classification and granite type.....	108

	Page
5.4.1.3. Magma type.....	112
5.4.1.4. Tectonic environment.....	112
5.4.2. The altered granite of G. Gattar.....	115
5.4.2.1. Geochemical characteristics.....	119
5.4.2.2. Evaluation of the degree of alteration.....	122
5.4.2.3. Mass-balance analyses.....	122
5.4.2.3.1. Major oxides configuration.....	124
5.4.2.3.2. Trace elements configuration.....	126

CHAPTER SIX: RADIOACTIVITY

6.1. General Statement	128
6.2. Procedures	128
6.2.1. Field procedures	128
6.2.2. Laboratory procedures	129
6.3. Distribution of the Total Gamma Activity	129
6.3.1. The Hammamat sedimentary rocks	131
6.3.2. The granite of G. Gattar	131
6.4. Radioactive Anomalies and Uranium Mineralization	131
6.5. Uranium and Thorium Chemistry	135
6.5.1. Uranium and thorium distribution	135
6.5.1.1. The Hammamat sedimentary rocks	139
6.5.1.2. The granite of G. Gattar	139
6.5.2. Interelement relationships	140
6.5.2.1. Relationship between U and Th with the other elements in the Hammamat sedimentary rocks	142
6.5.2.2. Relationship between U and Th with the other elements in the granite of G. Gattar	142
6.6. Radon Emanation Survey and Uranium Prospecting	145

	Page
6.6.1. The Alpha track technique	148
6.6.1.1. The basic principles of alpha track technique	149
6.6.1.2. Preparation for alpha track technique	149
6.6.1.3. Field work of alpha track technique	150
6.6.1.4. Chemical etching of alpha track	150
6.6.1.5. Study of alpha track under the microscope	150
6.6.1.6. Application of alpha track technique on G-V occurrence.....	152
6.6.2. Factors controlling radon emanation on G-V occurrence	156
6.7. Discussion	163
6.8. Recommendations	164
CHAPTER SEVEN: SUMMARY AND CONCLUSION	167
REFERENCES	174
ARABIC SUMMARY	