

شبكة المعلومات الجامعية







شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها على هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار في درجة حرارة من ١٥-٥٠ مئوية ورطوبة نسبية من ٢٠-٠٠% To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%



بعض الوثائـــق الإصليــة تالفــة



بالرسالة صفحات لم ترد بالإصل



South Valley University

GEOLOGIC, PETROGRAPHIC AND GEOCHEMICAL STUDIES OF URANIFEROUS GRANITOIDS IN EL GARRA – EL GIDAMI AREA, CENTRAL EASTERN DESERT, EGYPT.

A THESIS

PRESENTED BY FALHAM ORABY MAHMOUD

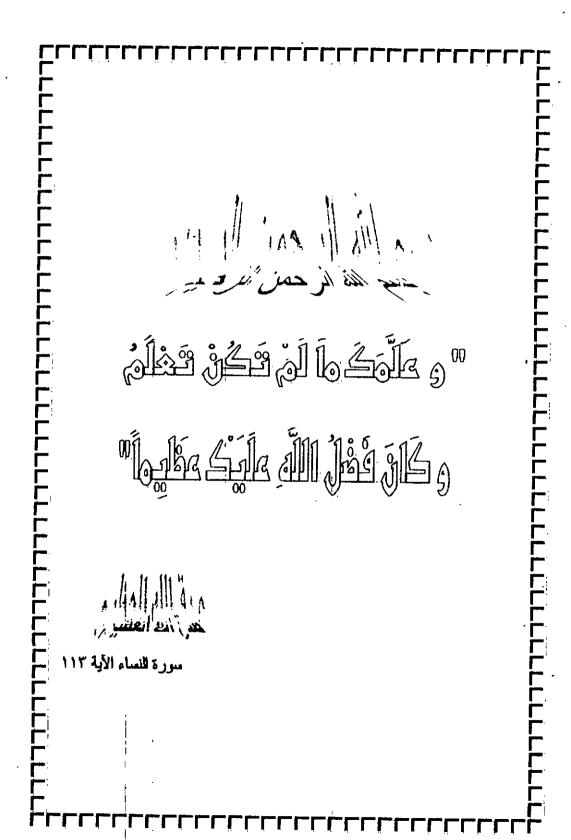
(B. SC. & M. SC)
NUCLEAR MATERIALS AUTHORITY (N. M. A)
CAIRO, EGYPT

SUBMITTED TO FACULTY OF SCIENCE (QENA)
SOUTH VALLEY UNIVERSITY
FOR THE DEGREE OF Ph. D.

IN GEOLOGY



1999





Approval sheet

Name: Falham Oraby Mahmoud.

Titlle: Geologic, petrographic and geochemical studies of uraniferous granitoids in El Garra – El Gidami area, central Eastern Desert, Egypt.

Supervisors.

- 1- Prof. Dr. Mamdouh Abdel Ghafour Hassanan
- 2- Dr. Mohammed Ali El-Tahir.
- 3- Dr. Abdelazem Ahemed Rashwan.

ACKNOWLEDGEMENTS

Praise is to ALLAH; the lord of the worlds, by whose grace this work has been completed

I wish to express my deepest gratitude to Prof. Dr. M. A. Hassan X-president of Nuclear Materials Authority (N.M.A) for suggesting the present point of study, for his kind supervision and encouragement during the development of whole work. His patient, faithful help, fruitful discussions and comments, in proved the thesis in many aspects to reach its present form.

I would like to express my deepest thanks and gratitude to Dr. M. A. El. Tahir and Dr. A. A. Rashwan Qena Faculty of Science, South Valley University for supervising the present thesis and invaluable advice.

My full thanks are due to Prof. Dr. S. N. Wassif, president of Nuclear Materials Authority (N.M.A), Prof. Dr. A. B. Salman vice-president of N. M. A. for valuable support and kind facility

I would like to thank Ass. Prof. Dr. A. Mansour, head of the geology department, Faculty of science (Qena), South Valley University for the facilities provided.

Special thanks are due to Prof. Dr. A. Hashad Nuclear Materials Authority for his discussions and providing useful comments. Also, thanks are due to Ass. Prof. Dr. M. Araif, Dr, S. Mawas South Valley University (Qena) for their discussions and helps.

I am greatly indebted to Prof. Dr. H. Schleicher; Mineralogisch-Petrolographisches Institute, Hamburg University, Germany, for his great help during carrying out geochemical analysis and the facilities provided during my study in Germany. Thanks are also due to all the members of his department.

Particular thanks are due to geologist s Dr. A. Abu Deif, S. Omair and A. Abu El Hassain, El Missikat center, at Qena – Safaga Road, (N.M.A) four their help. Thanks are due to everyone who have helped me to complete this work.

Finally, heart-felt thanks are due to my wife and my children who suffered a lot to make this work possible.

F. Oraby

CONTENTS

· · · · · · · · · · · · · · · · · · ·	age
Acknowledgements	
List of figures	iv
List of table	viii
Abstract	ix
CHAPTER ONE: INTRODUCTION	
1.1. General consideration	1
1. 2. Location and physiography	2
1. 3. Previous work	2
1. 4. Scope of the present study	5
CHAPTER TWO: GEOLOGIC SETTING.	
2. 1. General statement	7
2. 2. Sampling and mapping procedures	. 8
2. 3. Field relation of El Garra-El Gidami area	10
2. 3 - A. Amphibolite	10
2.3 - B. Gneissose granite	. 10
2. 3- C. Syn-tectonic granite	10
2. 3 - D. Younger granite	11
CHAPTER THREE: PETROGRAPHY.	
3. 1. Introduction	24
3. 2. Petrography	24
a- Albite granite	24
b -Perthite granite	27

CHAPTER FOUR: GEOCHEMISTRY	
4. 1. Introduction	35
4. 2. General geochemical features	36.
4. 21. Major elements ,,,,	.36
a- Comparison between El Garra-El Gidami Granite and	
Egyptian and world granites	36
b- Two-dimensional distribution plots	40
c- Binary relation of some major elements	41
4. 2-2. Trace elements	51
a- Comparison between El Garra-El Gidami Granite and	
Egyptian and world granites	51
b- Two-dimensional distribution plots	52
c- Binary relation of some trace elements	52
4. 3. Normative composition	76
4. 4. Differentiation of the studied granites	77
4. 41. Differentiation index against major elements	77
4. 4-2. Differentiation index against trace elements	86
4. 5. Tectonic setting	86.
4. 5-1. Maniar and Picoli discrimination diagrams	87
4. 5-2. Pearce et al., 1984 discrimination diagrams	87
4. 5-3. S and I type granite	91
4. 6.Conclusions	92
CHAPTER FIVE: DISTRIBUTION OF U AND Th IN EL GAR	RA-
EL GIDAMI PLUTON.	
5. 1. Introduction	95
5. 2. U and Th distribution	97
5 3 U and Th behavior with the major and trace elements	10 <i>€</i>

5. 4. Conclusions	119
CHAPTER SIX: MINERAL CHEMISTRY.	
6. 1. Methods of study	124
6. 2. Biotite	124
6. 2-1. Introduction	.124
6. 2-2. Major elements	135
6. 2-3. Temperature of El Garra-el Gidami biotites	128
6. 3. Radioactive minerals	129
CHAPTER SEVEN: SUMMARY AND CONCLUSIONS	133
REFRENCES	139
ARABIC SUMMARY.	

LIST OF FIGURES

]	Page
1-1. Location map of El Garra – El Gidami area	3
2-1. Samples location map	9
2-2. Geologic map of El Garra – El Gidami area	12
2-3. Aplite dykes intruded in albite granite	18
2-4. Sharp contact between albite granite (D) and	
amphibolite (Am)	18
2-5. Pegmatite lenses in the contact between gneissose	
granite and albite granite	19
2-6. Contact between albite granite (D) and fluorite perthite	
granite (M1)	19
2-7. Pegmatite pocket along the contact between albite	
granite and fluorite perthite granite	20
2-8. Chilled margin in the northern part of albite granite	
with well developed sheeting	20
2-9. Cavities in fluorite perthite granite (tafoni weathering)	21
2-10. Sharp contact between perthite granite (M2) and	
syn-tectonic granite (Sn)	21
2-11. Contact between pegmatitic perthite granite (M3) and	
fluorite perthite granite (M1)	22
2-12. Pegmatite pocket in pegmatitic perthite granite	. 22
2-13. Ferrugenation the joint which imparts a red	
color to the granite	23
3-1. Photomicrograph of albite granite showing	
a) blady primary albite with well-defined lamellar	
twinning. b) triangular area filled by intercumulus	
material CP, X 50	26

3-2. Photomicrograph of albite granite showing brecciation	
of quartz grains around plagioclase crystal. CP, X 50	26
3-3. Photomicrograph of perthite granite showing orthoclase	
perthite crystal with carlsbad twinning and string perthite	
intergrowth CP, X 25	31
3-4. Photomicrograph of perthite granite showing altered	
orthoclase crystals in cores while peripheries are	
still fresh. CP, X 50	31
3-5. Photomicrograph of perthite granite showing remnants	
of plagioclase in optical continuity inside potash feldspar	
CP, X 50	32
3-6. Photomicrograph of perthite granite showing myrmekite	
along the grain boundary of feldspar crystals. CP, X 50	32
3-7. Photomicrograph of perthite granite showing biotite	
grain totally decomposed to iron oxide. PP.L. X 50	33
3-8. Photomicrograph of perthite granite showing zoned	
zircon crystal (Z) and allanite crystal (A). CP, X 100	33
3-9. Photomicrograph of perthite granite showing fluorite	
with violet shades. PP.L. X 100	34
3-10. Photomicrograph of perthite granite showing euhedral	
allanite crystal. CP, X 100	34
4-1A-E. Two-dimension distribution plots of some major	
elements	42
4-2. TiO ₂ vs Fe ₂ O ₃ variation diagram	45
4-3. TiO ₂ vs CaO variation diagram	46
4-4. TiO ₂ vs Al ₂ O ₃ variation diagram	47
4-5. TiO ₂ vs MgO variation diagram	48
4-6. Na ₂ O vs CaO variation diagram	49
4-7. K ₂ O/Na ₂ O vs CaO variation diagram	50