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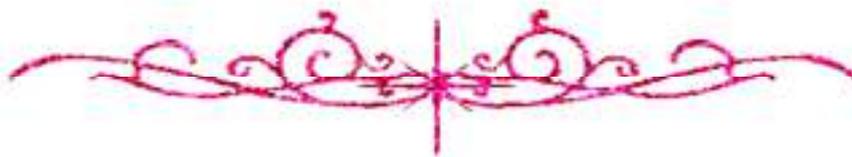


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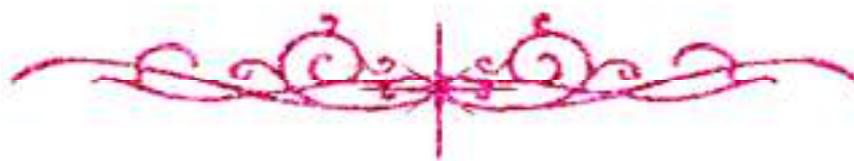
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**"PETROPHYSICAL PROPERTIES OF SOME
UPPER CRETACEOUS ROCKS,
WESTERN SINAI, EGYPT"**

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT FOR THE DEGREE
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BY

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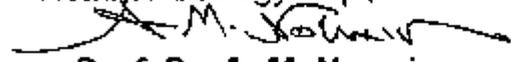
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CONTENTS

Subject	Page
ABSTRACT.....	a
CHAPTER ONE : INTRODUCTION	
1.1. Introduction.....	1
1.2. Scope and Aim of the Present Study.....	2
1.3. Oil Potentialities of Cretaceous Rocks.....	3
1.4. Location.....	4
1.5. Methodology.....	4
CHAPTER TWO : GEOLOGY, PETROGRAPHY AND MINERALOGY	
2.1. Previous Work.....	8
2.2. Geologic Setting.....	9
2.3. Stratigraphy.....	11
2.3.1. Raha Formation (Cenomanian).....	11
2.3.1.1. Distribution and lithology.....	11
2.3.1.2. Microfacies study of the Raha Formation.....	12
2.3.2. Wata Formation (Turonian).....	14
2.3.2.1. Distribution and lithology.....	14
2.3.2.2. Microfacies study of the Wata Formation.....	15
2.3.3. Matulla Formation (Lower Senonian).....	16
2.3.3.1. Distribution and lithology.....	16
2.3.3.2. Microfacies study of the Matulla Formation.....	17
2.4. Insoluble Residue Determination.....	18
2.5. X-Ray Diffraction Analysis.....	19
CHAPTER THREE : MAGNETIC FABRIC	
3.1. Introduction.....	21
3.1.1. Types of magnetization.....	21
3.1.2. Magnetic anisotropy and its representation.....	24
3.1.3. Types of magnetic fabric.....	27
3.1.3.1. Grain magnetic fabric.....	27
3.1.3.2. Pore magnetic fabric.....	28
3.1.4. Magnetic fabric applications.....	29
3.2. Sampling and Measurements.....	32
3.3. Results and Interpretation.....	33
3.3.1. Grain magnetic fabric.....	33
3.3.1.1. Initial fabric (Pre-heating).....	33
3.3.1.2. Enhanced fabric (After heating).....	35
3.3.1.3. Interpretation.....	37
3.3.2. Pore magnetic fabric.....	40
3.3.2.1. Sample impregnation.....	40
3.3.2.2. Results.....	41
3.3.2.3. Interpretation.....	42

3.4. Summary.....	43
CHAPTER FOUR : STORAGE CAPACITY AND ELECTRICAL PROPERTIES	
4.1. Introduction.....	45
4.2. Porosity.....	46
4.2.1. Laboratory measurements of porosity.....	47
4.2.2. Statistical analysis of porosity data.....	48
4.2.2.1. Determination of mean, median and mode values.....	48
4.2.2.2. Determination of the standard deviation of porosity data.....	49
4.2.3. Storage capacity.....	50
4.3. Rock Density Properties.....	50
4.3.1. Grain density (ρ_g).....	51
4.3.2. Bulk density (ρ_b).....	52
4.4. Permeability.....	53
4.4.1. Definition.....	53
4.4.2. Units of permeability.....	53
4.4.3. Permeability of reservoir rocks.....	54
4.4.4. Laboratory measurements of permeability.....	54
4.4.5. Statistical analysis of permeability data.....	55
4.4.5.1. Mean, median and mode permeability values.....	56
4.4.5.2. Standard deviation of permeability data.....	57
4.4.6. Permeability capacity.....	57
4.5. Relationships between Porosity, Permeability, Density and Textural Properties.....	58
4.5.1. Bulk density versus porosity.....	58
4.5.2. Insoluble residue versus bulk density.....	59
4.5.3. Gas permeability-log (K/ϕ) relationship.....	59
4.5.4. Packing index versus saturation ratio.....	60
4.5.5. Log (K/ϕ) versus porosity.....	60
4.5.6. Gas permeability versus porosity.....	61
4.5.7. Grain density versus porosity.....	62
4.5.8. Saturation ratio versus log (K/ϕ) ratio.....	62
4.6. Electrical Properties of Rocks.....	63
4.6.1. Introduction.....	63
4.6.2. Electrical resistivity.....	64
4.6.3. Formation resistivity factor.....	65
4.6.4. Electrical resistivity measurements.....	65
4.6.5. Resistivity index.....	66
4.6.6. Utilization of resistivity measurements.....	67
4.6.7. Water saturation and formation factor-porosity relation.....	67
4.6.8. Formation resistivity factor versus permeability.....	72
4.6.9. Formation resistivity factor versus bulk density.....	73

CHAPTER FIVE : ACOUSTIC AND MECHANICAL PROPERTIES OF ROCKS

5.1. Introduction.....	74
5.2. Laboratory Measurements of Acoustic and Mechanical Properties.....	78
5.3. Statistical Analysis of Velocity Data.....	78
5.3.1. Determination of mean, median and mode values of velocity data.....	78

5.3.2. Determination of the standard deviation of velocity data.....	79
5.4. Interrelationships among Petrophysical Properties.....	81
5.4.1. Correlation of the measured petrophysical properties.....	81
5.4.1.1. Compressional velocity versus some petrophysical parameters....	81
5.4.1.2. Shear velocity versus some petrophysical parameters.....	83
5.4.1.3. Square (V_p) versus some mechanical parameters.....	84
5.4.1.4. Square (V_s) versus some mechanical parameters.....	84
5.4.1.5. Acoustic-mechanical parameters relationships.....	85
5.4.2. Lithologic discrimination.....	86
5.4.2.1. Bulk density versus mechanical parameters.....	87
5.4.2.2. Insoluble residue versus acoustic impedance.....	87
5.4.2.3. Grain density versus mechanical parameters.....	88
5.4.2.4. Porosity versus acoustic velocities and bulk's modulus.....	88
5.4.2.5. Permeability and porosity versus acoustic impedance.....	89
5.4.2.6. (V_p) and (V_s) versus (V_p/V_s) ratio.....	90
5.4.2.7. Packing index (PI) versus compressive strength (C_o).....	90
5.4.2.8. Compressional velocity versus permeability.....	90
5.5. Reservoir Zonation and Homogeneity.....	90
5.5.1. Vertical profiles of some formation parameters at Gebel Nezzazat.....	91
5.5.2. Vertical profiles of some formation parameters at Gebel Qabeliat.....	92
SUMMARY AND CONCLUSIONS.....	95
REFERENCES.....	101
ARABIC SUMMARY	

ABSTRACT

ABSTRACT

The present study deals with evaluation of the petrophysical properties of some of the Upper Cretaceous rocks from the Raha, Wata and Matulla Formations that crop out along the eastern shoulder of the Gulf of Suez (south western Sinai), in the area located between latitudes $28^{\circ} 12'$ and $28^{\circ} 50'$ N and longitudes $33^{\circ} 12'$ and $33^{\circ} 35'$ E. For such study, 44 representative block samples were collected to study the different petrophysical parameters for reservoir evaluation. The collected samples were cut into plugs of 2.5 cm diameter and 2.2 cm length. Several petrographic investigations including microfacies analysis, thin section-staining, X-Ray diffraction and insoluble residue were carried out. Afterwards, petrophysical investigations including magnetic fabric, storage capacity properties, electrical properties, acoustics, and mechanical properties, were executed.

The following results were obtained:-

The petrographic and mineralogical observations reveal that the present Upper Cretaceous rocks are composed mainly of sandstone, limestone, dolomite and sandy dolomite and that calcite, dolomite and quartz are the essential minerals constituting most rock parts of the studied formations. Other minor constituents are gypsum, halite, glauconite, phosphate pellets and iron oxides.

-Grain magnetic fabric results indicate that most parts of the studied rocks are still holding their original depositional fabric except in few beds where weak secondary fabric is developed. Pore magnetic fabric analysis, on the other hand, has enabled the depiction of average orientation and shape irregularity of interconnected pore spaces. It indicates that pore spaces are predominantly connected parallel to bedding (i. e. bedding-parallel permeability) in a rather homogeneous distribution except where partial recrystallization is suspected pore orientation takes no definite trend.

- Storage capacity properties including porosity, permeability and density have revealed different origins for sample porosity and permeability. The measured porosity ranges from 2.9 to 22.5%, 2.5 to 28.3% and from 4 to 29% for the Raha, Wata and Matulla Formations, respectively, while the measured nitrogen permeability is found to be ranging from 0.4722 to 469.41 $\times 10^{-3}\mu\text{m}^2$, from 0.492 to 343.26 $\times 10^{-3}\mu\text{m}^2$ and from 0.4811 to 120.07 $\times 10^{-3}\mu\text{m}^2$, for the Raha, Wata and Matulla Formations, respectively. The measured grain density for the Upper Cretaceous rocks ranges from 2.61 to 2.89 g/cm^3 with an average value of 2.76 g/cm^3 . However, several significant interrelationships are obtained among these properties.