# RESERVOIR EVALUATION OF SOME MIOCENE FORMATIONS IN SHUKHEIR AND KAREEM OIL FIELDS, GULF OF SUEZ, EGYPT

**A THESIS**

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MASTER DEGREE OF SCIENCE
( Geology )

By

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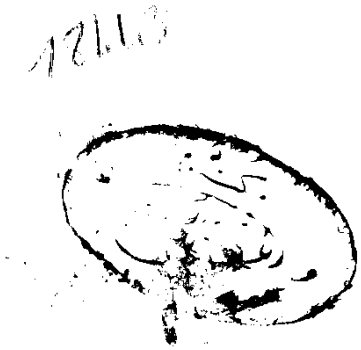

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# N O T E

The present thesis is submitted from Salah Eldin Abdel Wahab Mohamed Mousa to Ain Shams University in partial fulfilment of the requirements for the Master Degree of Science in Geology.

Beside the research work materialized in this thesis, the candidate has attended nine of the post-graduate courses during one year in the following topics :

- Field Mapping
- Tectonic Position of Egypt
- Laboratory Techniques.
- Structural Geology
- Geotectonics
- Data Processing
- Applied Geophysics
- Potential Theory
- Filtering Techniques.

He has successfully passed the final examination of these courses. In addition, the student has successfully passed the German language examination.

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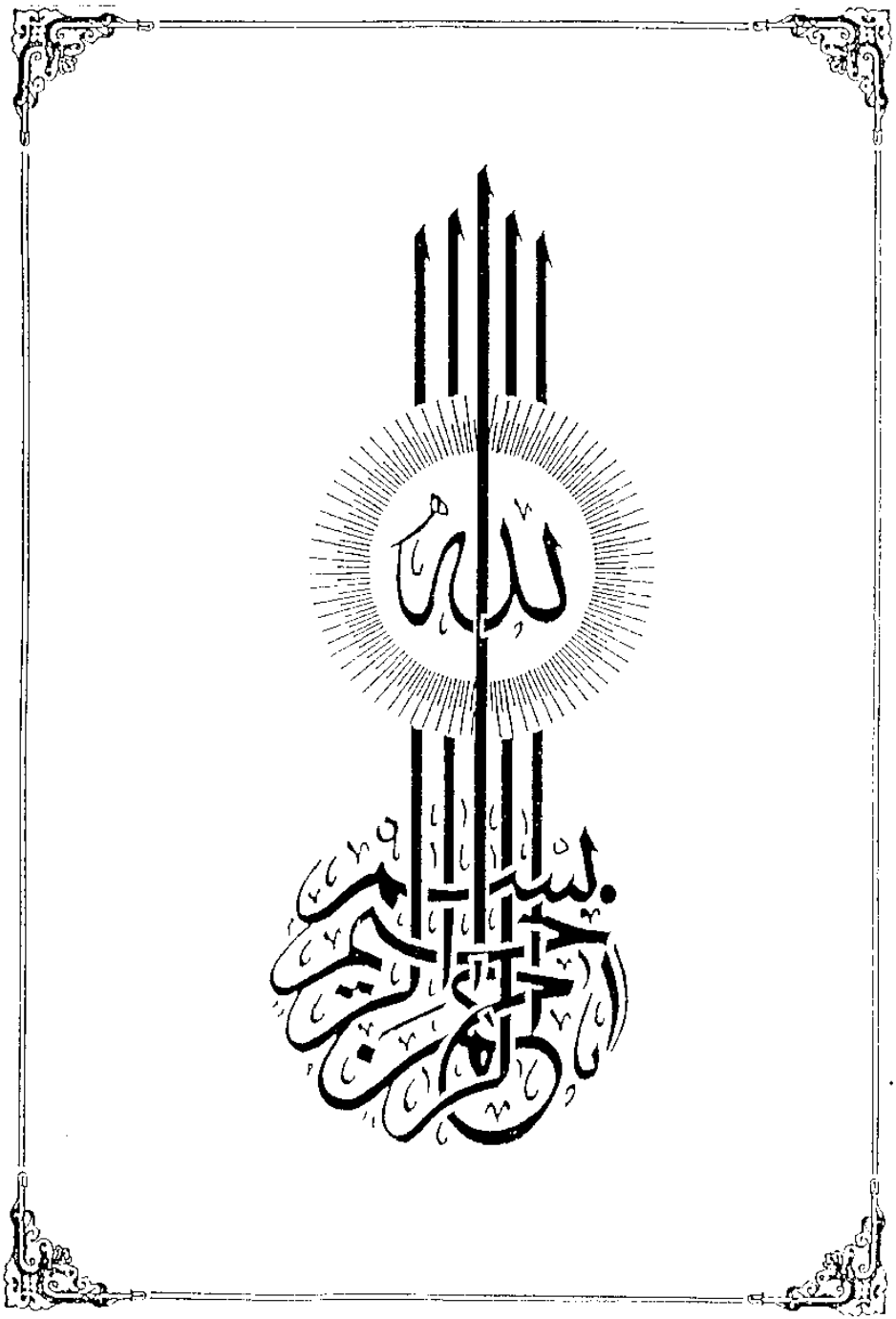

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## ABSTRACT

Petrophysical studies on the reservoir rocks play an important role in the discovery, evaluation and distribution of the productive zones. Oil and gas reservoirs exhibit complex variations of reservoir continuity and pore space geometry (porosity and permeability).

The storage capacity properties which affect the ability of a rock to store fluids are porosity, permeability and rock density. These properties are measured directly using different laboratory techniques, or they are evaluated with other tools through their relations such as the formation resistivity factor and resistivity index.

The present study deals with the petrophysical studies on some Miocene rocks from both Kareem and Shukheir oil fields in the Eastern Desert. For such study 29 core samples were selected representing the Miocene sections encountered in 12 wells scattered in both Kareem and Shukheir oil fields. Out of the 29 core samples, only 14 samples are representing Nukhul Formation in the bore holes number 6, 9, 10, 11, 14, 21, 25, 26 and 28 in the Kareem oil field. The rest are comprising the Belayim Formation encountered in the bore holes number 1, 2 and 4 in the Shukheir oil field. These samples were extracted from the residual oil, then; petrophysical and petrographical studies were carried out on them.

The area under study which lies between latitude 28° 00' and 28° 15' N. and longitude 33° 00' and 33° 15' E, was discovered by the General Petroleum Company as a result of geophysical surveying. Kareem and Shukheir oil fields embrace on area of about 7.4 and 54.0 $Km^2$ respectively.

The field of study includes the following :

1. General geology which include the stratigraphy, structural setting and geologic history of the Gulf of Suez with reference to the area under investigation.

2. Environmental analysis based on grain size analysis of Shukheir sandstone samples and biofacies analysis of the Kareem limestones.

3. Study of the storage capacity properties including : porosity, permeability and density of the rock samples and their relationships to the lithologic properties with respect to hydrocarbon accumulations and flowing capacity of the geologic intervals in question.

4. Study of pore geometry and its morphology for the selected samples and their diagenetic effect on the reservoir properties, based on the insoluble residue technique, thin section petrography, scanning electron microscope and X-ray diffraction analysis.

5. Study of electrical properties of the rock samples as electrical resistivity, cation exchange capacity and resistivity index, and their relationships to the storage capacity and lithologic properties.