MINERALOGICAL AND GEOCHEMICAL STUDIES OF SOME SUBSURFACE SEDIMENTS IN THE NILE DELTA

THESIS

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A B S T R A C T

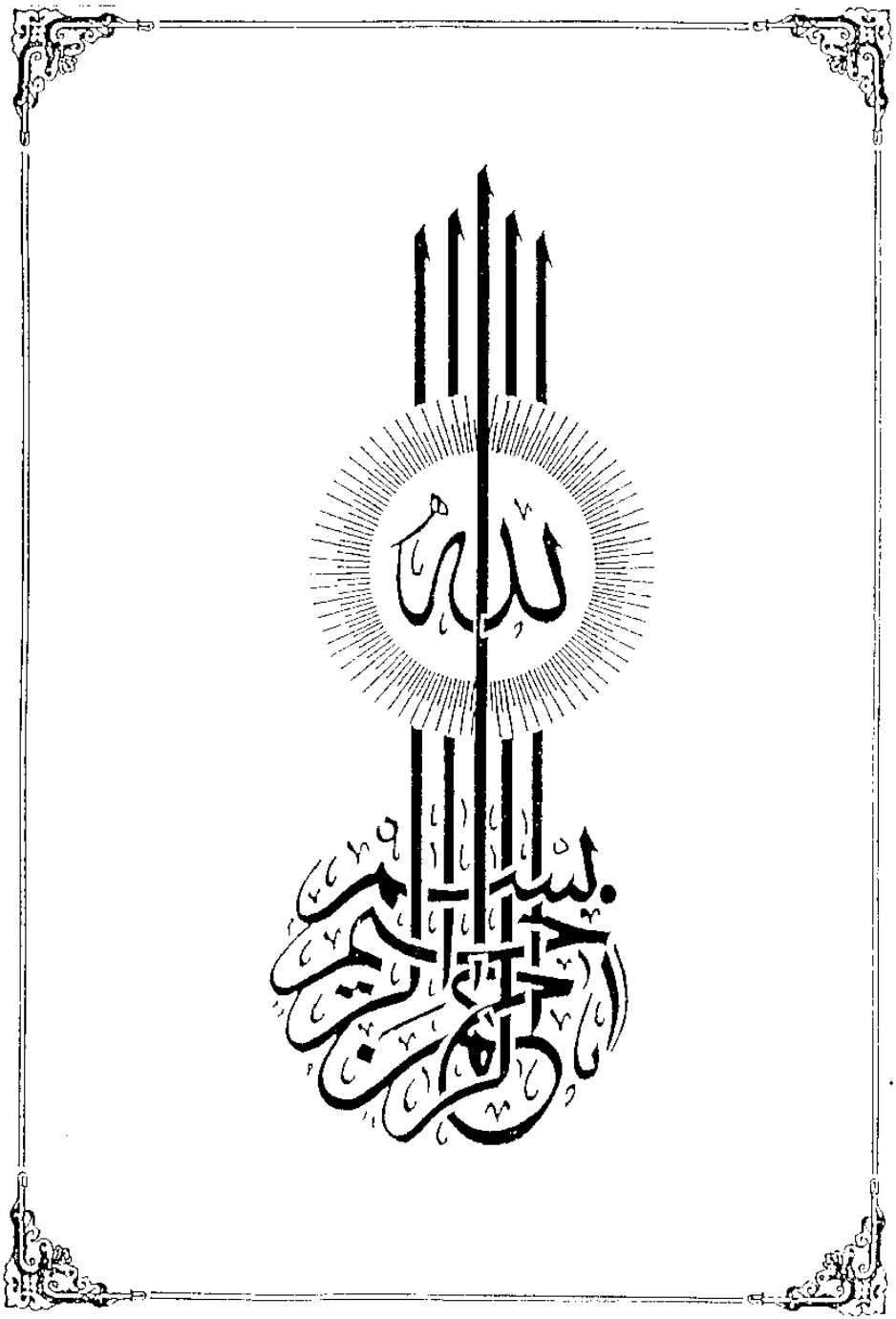
The subsurface sections of the Nile Delta offshore wells NDO.A-1 and NDO.B-1 were studied by several sedimentological, mineralogical and geochemical techniques. The main results of the present study can be reported as follow :

The sand samples are mainly medium grained with the increase of size grade in the upper parts of the Miocene and lower parts of the Pliocene. The samples are generally moderately sorted, fine skewed and having variable kurtosis values. In general, these sands are generally mineralogically and texturally mature, representing an alluvial facies which can be changed to a beach condition in some parts by a transgression of marine facies. Mineral composition of these sands is dominated by quartz.

The non-opaque heavy minerals assemblage [illegible] the probability of multiple sources which may be the main provenance for both Miocene and Pliocene deposits. This assemblage includes kyanite, epidote, diopside, hornblende, staurolite, garnet, chlorite, rutile, zircon, tourmaline and actinolite in a decreasing order of abundance.

The argillaceous sediments are dominated by silt and are composed essentially of smectite and kaolinite.

Several diagenetic processes have affected the sediments (e.g. cementation, neoformation of minerals, pyritization and silicification).



The sediments were found to be depleted in SiO_2, K_2O and enriched in TiO_2, Fe_2O_3, MgO and Na_2O supposing more mafic source.

The sediments are rich in organic matter but not attained the maturity degree of oil or gas production.

N O T E

The present thesis is submitted from Abdou Ahmed Abdou to Ain Shams University in partial fulfillment of the requirements for the degree of Master of Science in Geology.

Beside the research work materialized in this thesis, the candidate has attended ten graduate courses for one year in the following topics.

- Crystallography
- Advanced Mineralogy
- Geochemistry
- Lithostratigraphy
- Statistics
- Sedimentation
- Sedimentary Petrology
- Igneous Petrology
- Metamorphic Petrology
- German Language.

He has successfully passed the final examination of these courses in February 1981.

Prof. Dr. Mohamed El-Amin Bassiouni

Head of the Geology Department

C O N T E N T S

LIST OF FIGURES

LIST OF TABLES

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INTRODUCTION