

A PRELIMINARY STUDY OF THE NATURE OF HYDROCARBON IN THE TWO MAJOR MESOZOIC SOURCE ROCKS (NAJMAH AND SULAIY) IN KUWAIT

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The Najmah and Sulaiy (Makhul) Formations are the two major source rocks in Kuwait and its surrounding areas. These carbonate formations (Jurassic and Early Cretaceous age respectively) are separated by a thick salt and anhydrite layer of the Hith and Gotnia Formations. Many studies showed that most of the oil accumulated in the Cretaceous, Tertiary and Jurassic reservoirs in Kuwait are generated from these source rocks (Abdullah and Kinghorn, 1996; .Abdullah and Connan, 2002)

The Najmah Formation is composed of packstones and argillaceous and bituminous limestones deposited in anoxic outer-shelf conditions. The formation has an average thickness of 210 ft. Besides being a potential source rock, it has been identified in its fractured zone as an important reservoir. The formation is bounded at the top by an unconformity above which lie the Gotnia evaporites. The formation is a high potential source rock with an average TOC of 7% wt and may reach as high as 25% wt. Two peaks of TOC are associated with laminated intervals (plate 1). The kerogen is type II and is mature especially in its deepest part in the northern fields in Kuwait.

The Sulaiy Formation is the oldest formation in the Lower Cretaceous sequence of Kuwait. It is dark-grey argillaceous limestone with an average thickness of 200 ft. The formation is underlain with the Hith Formation and overlain with the Minagish Formation, one of the major reservoirs in the southern oil fields in Kuwait. TOC value ranges between 0.4 and 2.7% wt with its highest value in the laminar structure part (plate 2) of the formation. The kerogen is type II and mature especially in its deepest northern part of the state.

This study is a preliminary evaluation of the nature of the hydrocarbons along these source rocks and the salt and anhydrite section between them. Considering vertical migration, the results may show the changes in the nature of hydrocarbons along the migration path. This will be carried out using RE6 reservoir methods to screen the samples and accordingly some samples will be chosen for detail study of its composition. The

analyses will be carried on 57 core samples collected from three oil fields, one from the south and two from the northern oil fields in Kuwait.

REFERENCES

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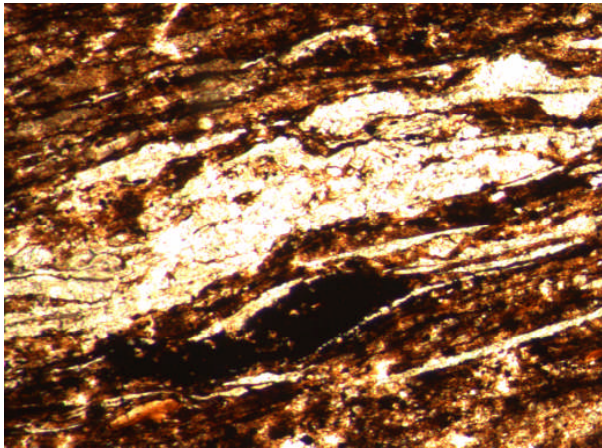


Plate 1 Laminar bedding rich in organic matter in the Najmah Formation in the Minagish Field south Kuwait

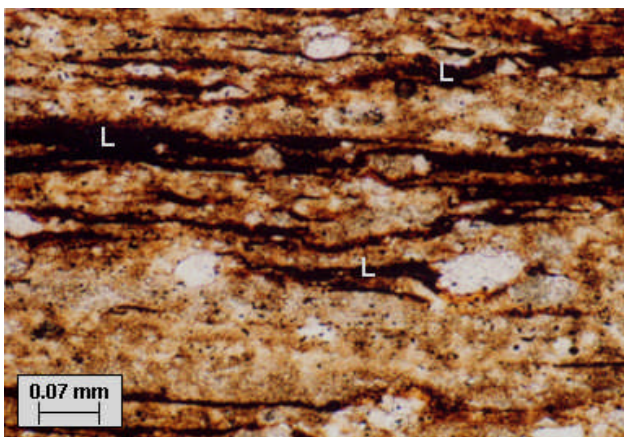


Plate 2 Laminar bedding in the Sulaiy Formation in the Mutriba Field north Kuwait