

Basin Modeling of Parts of the Niger Delta: Thermal Maturity Evaluation and Prediction of Petroleum Generation

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Abstract

Predicting petroleum generation is a critical issue in prospect evaluation for the deeper prospects in the Niger delta basin (Fig 1.1) because of its economic implications. Ascertaining the presence, types and volumes of hydrocarbons in a prospective structure before drilling is an excellent way in reducing investment risk in oil and gas exploration.

Efforts have been made to predict hydrocarbon charge in the Niger Delta using Seismic interpretation to delineate closed structures and identify potential subsurface traps, but it does not reliably predict trap content. Drilling on a closed structure, even near a producing oil or gas field, holds no guarantee that similar fluids will be found. Profitable exploration requires an approach to predict the likelihood of success given the available data and associated uncertainties.

The aim of this work is to analyze the charge history in the deep prospect across some parts of the Niger Delta Province. The objectives of this study amongst other things include;

- Reconstruct the burial history of the area
- Modeling the thermal history of the area.
- Generate the maturation history of the source rocks.
- Predict the petroleum generation in the deep prospect using basin modeling.