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Paleoenvironments and Hydrocarbon Potential of Upper Cretaceous Shales in Agbabu-1 Well, Dahomey Basin – Insight from Geochemistry and Foraminifera Paleontology

Adekeye Olabisi Adeleye

Department of Geology and Mineral Sciences, University of Ilorin, Nigeria

Ogundipe Olumide

Department of Geology and Mineral Sciences, University of Ilorin, Nigeria

Adeoye James Adejimi

Department of Geology and Mining, Ibrahim Badamasi Babangida University, Lapai, Niger State, Nigeria

Adeyilola Adedoyin

Central Michigan University, Mount Pleasant, Michigan, North Dakota, USA

Samuel Olukayode

University of Newcastle, upon Tyne, UK

Akande Samuel Olusegun

Department of Geology and Mineral Sciences, University of Ilorin, Nigeria

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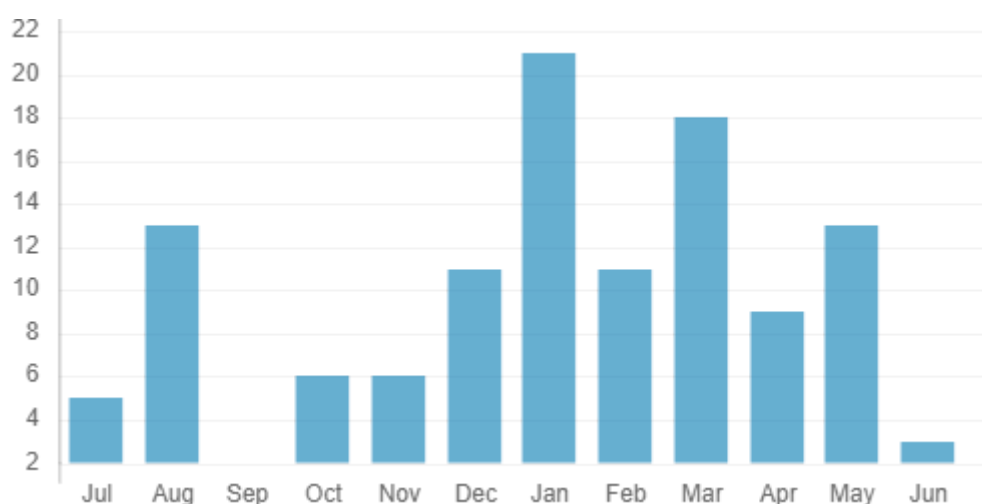
Abstract

Upper Cretaceous shales partially exposed in the northern fringes of the Dahomey Basin are well developed in the subsurface in Southwestern part of the basin where Agbau-1 well is sited. These

shales were evaluated in respect to their paleoenvironments and potentials for hydrocarbon using foraminiferal assemblages, biomarkers and Rock Eval pyrolysis studies. The dominance of benthonic foraminifera species suggests a shallow marine environment and high percentage of calcareous to arenaceous benthic www.eujournal.org 195

foraminifera indicate high water salinity and hypersaline environment. Dysoxic oxygen condition is also prevalent probably because most of the benthic foraminifera recovered are epifauna that live in a reduced oxygen condition. 1.90 wt%, 244 mgHC/gTOC and 429°C average values of total organic carbon, hydrogen index and Tmax reveal that the Upper Cretaceous shales have relatively fair to good organic matter, predominantly Type II-III kerogen and currently immature. Though there is a trend of an increase in maturity down the hole. All the steranes have uniform distributions (C27>C28>C29), suggesting a relatively higher input from the marine red algae and a low level of land plant contribution to the source organic matter. Pristane/phytane ratios and C29/C27 steranes confirmed the organic matter type to be a Type II/III and anoxic source rock depositional condition as well as a reducing diagenetic system in the sediment water column. The Upper Cretaceous shales in Dahomey Basin can be targeted for exploration as an unconventional petroleum resource.

Downloads



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