

The Depositional Environment and Hydrocarbon Potential of the Maastrichtian- Paleocene Sedimentary Successions Penetrated by the Itori Borehole in the Dahomey Basin, South Western Nigeria

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The depositional environment and the hydrocarbon potential of the shales and limestones of the Maastrichtian - Paleocene sedimentary successions in the Abeokuta Group penetrated by the Itori borehole has been carried out. The total depth of the borehole is approximately 165m.

Petrographic studies of the carbonate rocks (Limestone) reveal at least three different rock types (microfacies) including Bioclastic packstone, sandy Bioclastic wackestone and Sandy bioclastic packstone. These rock types consist of both bioclastic and non bioclastic grains. The bioclastic grains are mainly gastropods, pelecypods, foraminifera, corals and many broken fragments of undeterminable bioclast. The non bioclastic grains are mostly quartzs of sand size and lithoclasts. The shales are grey to dark grey in colour consisting many different specie of benthic foraminifera including Eponides Africana, Gavelinella c.f guineana, Gavelinella pachysuturalis, Lenticulina olokuni, Lenticulina psuedomamilligerus, Nonionella panamensis, Nonionella communis and planulina oyaе.

Rock eval pyrolysis study performed on some selected shale samples give values of TOC range between 0.5wt% and 0.99wt%, Source potential (SP) value range between 0.55kgHC/ton and 1.2kgHC/ton, Hydrogen index value range between 78mgHC/g rock and 103.26mgHC/g rock and Tmax value range between 430°C and 470°C. These result suggest that the shale sediments under investigation are immature to marginally mature for hydrocarbon generation.

Integration of the petrographic and paleontology studies on the limestone and shale suggest a shallow marine shelf, lagoonal depositional environment. This is further supported by the benthic foraminifera assemblage recovered from the shale sediments