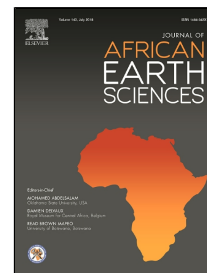


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Reservoir characteristics of the Kuhlan sandstones from Habban oilfield in the Sabatayn Basin, Yemen and their relevance to reservoir rock quality and petroleum accumulation



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1 **Reservoir characteristics of the Kuhlan sandstones from Habban oilfield in the Sabatayn**
2 **Basin, Yemen and their relevance to reservoir rock quality and petroleum accumulation**

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10
11 **Abstract**

12 Integrated petrophysical and petrographic analyses were performed on the Kuhlan clastic rocks
13 to evaluate the petrophysical reservoir properties, identify grain sorting along with the clay type
14 and mineral volumes using well logs coupled with core data. Core samples were collected from
15 two key wells and their results were used to determine the reservoir properties and bulk
16 mineralogical composition and, additionally, to calibrate the well log results from three un-cored
17 to the two cored wells.

18 The Kuhlan clastic reservoir rocks have porosity values between 6% and 12%. These porosity
19 values are mainly intergranular primary and secondary porosity. Permeability is likewise variable
20 with values in the range of 78–304 mD. The Kuhlan reservoir rocks also have high hydrocarbon
21 saturation exceeding 70%, with relatively high movable oil. These reservoir properties are
22 achieved from log-derived and core porosity and permeability results.

23 The lithology and mineral composition of the well logs and petrographic studies in this study
24 indicate that the Kuhlan sandstone can be considered as an alternative reservoir rock in the basin.

25 The Kuhlan Formation is primarily composed of sandstone that contains quartz, feldspar (i.e.,
26 orthoclase, plagioclase (albite) minerals and illite, and calcite cements. The quartz mineral is
27 dominant followed by feldspar as the second most abundant mineral in this formation. The

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