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Extended Abstract

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Chemistry Congress: 2018 Physical and chemical characterization and evaluation of organic matter from tar-mat samples: Case study of Kuwaiti carbonate reservoir- Abdullah O. Almansour

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Columns of tar exist in many carbonate reservoirs in the Middle East. The presence of tar mats has become one of the most serious problems in the petroleum industry, as has the impact of additional oil recovery technologies (IOR). in itself. Tar mats, which are mostly semi-solid dark brown to black, can isolate the aquifer from an oil reservoir. Understanding the tar mats and being able to characterize and identify them is essential to minimize production costs and strategically produce crude oil. The study of the objective presented here was to characterize the physical and chemical properties of highly viscous tar oil.

Five tar cores were taken from a Kuwaiti carbonate reservoir and 13 samples were prepared from each tar carrot. One core from each sample was used for evaluation before extraction, while the other 12 were used for evaluation after extraction with toluene, C, 135 ° C, 225 ° C, and 315 ° C). Thermal genesis of the tar oil samples were analyzed using new techniques such as macro-primary analysis Vario 106, pyrolysis Rock-Eval 6, the Soxhlet apparatus and thin layer chromatography. The results of the Rock-Eval 6 pyrolysis showed that the Kuwaiti carbonate reservoir was the subject of petroleum / gas (kerogen type II and II-III). Most of the samples were thermally mature and good in terms of hydrocarbon generation. However, These samples were produced from oil. In addition, the H / C ratio increased as the API decreased. In addition, the results showed that most of the parameter values, while hot water and surfactant, were only slightly affected. hydrocarbons. However, the oil could not have been produced from these samples. In addition, the H / C ratio increased as the API decreased. In addition, the results showed that most of the parameter values, while hot water and surfactant, were only slightly affected. hydrocarbons. However, the oil could not have been produced from these samples. In addition, the H / C ratio increased as the API decreased. In addition, the results showed that the toluene had the most impact on the parameter values.

Tar mats are very common in Kuwait and are usually located at the bottom of the oil column. In petroleum tanks, the thickness of the column of tar mats can vary even in the same tank and can reach a few hundred feet of tar mats with petroleum or extra heavy bitumen and have API ° and / or viscosity in situ above 10,000 cp. Due to their high content of asphaltenes, the order of 20 to 60% of their weight, the tar mats have a low gravity and a high viscosity according to Wilhelms and Larter. Asphaltenes are the highest molecular weight hydrocarbon components of petroleum.

The tar mats are located near the base of the oil buildup or near the surface when the oil infiltrates. Geochemical studies have shown that the thermal formation of a number of causes is related to Moore and Hirschberg. Most researchers believe that tar mats are formed by the combination of asphaltenes or variations in the oil column, which causes differences in oil viscosity. Five tar cores were selected from a carbonate tank in Kuwait at depths of 2,674 ft, 2,703 ft, 2,723 ft, 2,755 ft and 2,782 ft. Then, 13 samples were taken from each core; One sample from each carrot was used for evaluation before extraction, and the other for 12 The properties of tar mats can vary depending on the depth and area of the same field. Analysis of physical properties / water. Elemental analysis of the tar carpet samples showed that the H / C ratio increased as the API gravity decreased.

Rock-eval 6 and TOC analyzes have shown that most tarp carpet samples have excellent generation potential. These samples had high TOC values (> 4% by weight) and S2 pyrolysis values between 38.88 and 73.54 mg HC / g rock. The HI versus Tmax and OI diagrams showed that this formulation was composed of types II and II / III kerogens of terrestrial or marine origin capable of emitting oil and gas. In addition, the values of Tmax, transformation ratio (PI) and reflectance of vitrinite (% Ro) suggest that this formation went from immature to maturity. Based on the assessment of organic matter, the five tar cores taken from the samples

The SARA analysis of the results showed that the tar carpet samples contained less resins and asphaltenes than saturated and aromatics. In addition, the Colloid Instability Index (CII) values were calculated using the SARA method of predicting the stability of crude oil. Samples AB3, AB4 and AB5 had lower CII values, 9 0.9, indicating that their deposition of asphaltenes tended to be aromatic and resinous. On the other hand, the CII value was greater than 0.9 for the samples AB1 and AB2, which are two of these samples.

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