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Petrophysical study of szolnok formation, endrod gas field, Hungary

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Investigation of rock porosity and permeability is highly beneficial for geologists, petro-physicist and petroleum engineers in order to evaluate reservoir pore space geometry through the time and space. Clastic reservoir quality and classification could perform based on the petrophysical data correlations. Study of the Szolnok Formation in is our target. It composed mainly of sandstones with clay-marlstone and siltstones. Two hundred thirteen core samples of Upper and Lower Pliocene and Miocene age were subjected for petrophysical investigations. Pore size distribution using MICP, Mercury and Helium porosity, horizontal and vertical permeability were measured for studied core samples. The Szolnok Formation has two main lithologic facies: a. 141 clean sandstone samples and b. 72 siltstone and clay- marlstone samples. Ultrasonic laboratory measurements were carried out for only 30 selected sandstone core samples. Sonic viewer-120 is used to measure sonic velocities and other mechanical properties such as rigidity, bulk modulus and Young's modulus. Gas permeability and Helium porosity were plotted versus sonic wave velocity indicates that both permeability and porosity could be outlined from either compressional or shear wave velocity. Effective pore radius is outlined from both of them. The highest sample porosity was recorded for the Miocene in age followed by the Lower Pliocene and then for the Upper Pliocene samples respectively. Miocene samples exhibit relative clay free followed by Lower Pliocene samples because they have higher sonic velocity (Vp and Vs) than the Upper Pliocene samples. The Miocene and Lower Pliocene samples have relatively lower dynamic mechanical parameters than Upper Pliocene samples which represent good gas reservoirs in the Endrod field. Several regression line equations with high coefficient of correlation have been calculated to predict Szolnok reservoir parameters.

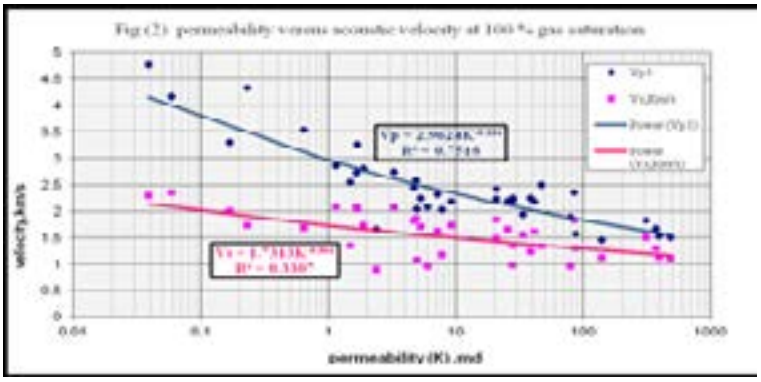

Figure 1: Permeability versus acoustic velocity at 100% gas saturation

Biography

Abdel Moktader A El Sayed has expertise in Reservoir Geophysics and Petrophysics. He is an Emeritus Professor in the Department of Geophysics at Ain Shams University, Cairo, Egypt. He has studied different types of hydrocarbon reservoirs for more than 45 years. He has used different laboratory instruments for outlining MICP, SEM, NMR and others. He has published more than 78 scientific articles in international and national journals. He is a member of several scientific societies in Egypt and abroad; he has specialized in Geology and Geophysics.

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