**Experimental simulation of proppant permeability in hydraulic fracturing at extended time under bottom‑hole conditions**

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**Abstract:**

During hydraulic fracturing treatment, huge quantities of gel are pumped into the formation to initiate the fracture, maintain it open and transport the proppant. The fracture dimensionless conductivity (Fcd) is a key parameter to optimize the fracturing design, to estimate the productivity Index (PI) and the folds of increase (FOI). However, these parameters are affected by the gel residues which decrease the fracture conductivity; thus, the proppant cleanup is a very important step to avoid additional damage caused by fracturing fluid due to high gel concentration and the extended time of gel staying in the fracture before cleanup. Throughout the life of Hassi Messaoud, Algeria field, hydraulic fracturing technique has been aggressively used mainly in four producing formations in the Cambrian, with hard formation characteristics, an average permeability range and low reservoir pressure (0.15 – 0.45 psi/ft) and high stress value between 6,000 psi and 9,000 psi. An experimental simulation is applied using a self-made cell to determine the effect of different parameters on the fracture conductivity under various bottom-hole conditions where different variables were used: effect of Proppant type, guar gel concentration, temperature, breaker concentration and closure pressure at extended time. An important drop in fracture conductivity was observed varied between 10% to 80% under stresses at interval of 2,000 psi and 8,000 psi, gel concentration up to 200 lb/1000 gal at extended time and temperature.

**Biography of presenting author** (should not exceed 100 words)

Ali Seyfeddine GUENAOUI is a Ph.D candidate, teacher and member in the laboratory of Laboratory of underground oil, gas, and aquifer reservoirs at the university of Ouargla since 2017. He joined the University in 2012, graduated with a Bachelor’s degree in 2015 and Master’s degree in 2017 in petroleum drilling, where he was awarded as top of class. Ali Seyfeddine joined Schlumberger in 2018 as Stimulation Field Engineer where he worked in Algeria and Chad and was awarded as Top Performer in Middle east learning center of Schlumberger.

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