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SAGDEH (Steam Assisted Gravity Drainage and Electromagnetic Heating)

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In regards to the most recent economic concerns stirred by the sudden drop in the prices of crude oil, major oil producers face the issue of having to maintain operational profitability in light of nearly constant demand and fluctuating prices. EOR techniques nowadays are the solution to overcome economic challenges and to increase the recovery factors of the oil reservoirs. SAGD (Steam Assisted Gravity Drainage) is a famous EOR technique, and it really works in heavy oil reservoirs and sand oil basins (bitumen). SAGDEH (Steam Assisted Gravity Drainage and Electromagnetic heating) is an EOR technique that combines the known SAGD technique and Electromagnetic heating of heavy oil. The metal structures that supplied by electrical energy from the surface are installed within the subsurface structure of the drilled pipes. The method basically aims to enhance the recovery of the heavy oil during the supercritical steam injection as a solvent for a specific period of time generating heat from electromagnetic field will decrease the viscosity of the heavy oil or sand oil and increase its mobility. In this paper, we will simulate a reservoir and build a model that shows the time needed for the supercritical steam to decrease the viscosity of the oil, and allows it to move downwards towards the production well due to both: Gravity and the electromagnetic heat. This will lead to increase the production rate due to the combination of two EOR methods. In order to direct the flow of the steam and to control its drive, we will use ICDs (Inflow Control Devices). ICDs help maintain injection rates across the total depth of the open hole completions.

Biography

Mahdi Khalifeh is a Lebanese American university student majoring petroleum engineering (4th year). He contributed in several leadership programs and member of "tomorrow's leader" club in the university. Member of the broadening perspective program which is formed from 10 engineering students. Participating in several petroleum conferences and workshops (geo16 Bahrain, oil and gas conference Lebanon,...).

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