Oil & Gas Research
ISSN: 2472-0518

Commentary Open Access

In the Daqing Oilfield, Multiple Linear Regression was Used to Screen CO_2-Driven Reservoirs

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Commentary

A reference standard for screening CO_2 flooding reservoirs suitable for the Daqing Oilfield should be established, and the influencing indexes of CO_2 flooding may be separated into three categories: geological variables, fluid properties, and development indexes. The evaluation index system is built, and the hierarchical structure is constructed, based on the importance of many criteria. The human subjective analysis mistake is relatively substantial in the process of developing the evaluation index system, especially in the fitting curves created by various analysts are likely to be different [1]. A typical CMG model is built in this research using the geological parameters of block Bei 14 in the Daqing Oilfield. For multiple linear regression calculations, 15 factors in the 72 models are used as independent variables, and the recovery factor is used as a dependent variable. Sensitivity tests are also performed based on the magnitude of the absolute value of the significance indicator t in the calculated results. Standard statistical methods can be used to compute a unique result from the computation results of the multiple linear regression model if the model and data utilised are the same [2].

The screening standard assessment system score findings match to the oilfield's practical production history based on a mathematical understanding of multi-factors on CO_2 flooding effect. Oil saturation falls dramatically around the high-scoring wells, and cumulative production is often larger than that of the low-scoring wells. The calculation results for block Bei 14 reveal that the evaluation value of 76% of well groups is greater than 0.50, and the annual oil exchange ratio of 72% of well groups is around 40%, indicating that more than 70% of well groups are eligible for CO2 flooding to boost oil recovery. As a result, CO_2 flooding has a promising future in Daqing Oilfield, and the multiple linear regression evaluation approach can provide useful recommendations in the Daqing Oilfield development process [3].

When low-temperature combustion techniques in engines are studied, iso-octane is typically employed as a surrogate fuel or as a component in primary reference fuel blends. The reaction kinetics of iso-octane must be understood from low temperatures and intermediate pressures before ignition to high temperatures and pressures during combustion in order to create control techniques for these engines. By exploring the oxidation of iso-octane in stoichiometric mixtures in a flow reactor at pressures of p = 1, 10, and 20 bar at 473K T 973K, this work provides fresh experimental data sets to the validation data for reaction mechanism development [4]. The experimental results are compared to recent reaction mechanism simulations. For all investigated pressures, the comparison of experimental and simulated mole fractions as a function of temperature shows reasonable agreement. The simulations accurately reproduce the experimentally known commencement of low-temperature reactivity above a specific pressure, the shift of the negative temperature coefficient (NTC) regime with increasing pressure to higher temperatures, and the acceleration of high-temperature chemistry. At low temperatures, differences between experimental and simulated results for iso-octane and other critical intermediates such as 2,2,4,4-tetramethyl-tetrahydrofuran, isobutene, and acetone are explored in detail [5].

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Received: 10-May-2022, Manuscript No. OGR-22-64334; **Editor assigned:** 12-May-2022, PreQC No. OGR-22-64334(PQ); **Reviewed:** 20-May-2022, QC No. OGR-22-64334; **Revised:** 25-May-2022, Manuscript No. OGR-22-64334(R); **Published:** 30-May-2022, DOI: 10.4172/2472-0518.1000241

Citation: Shaqiri S (2022) In the Daqing Oilfield, Multiple Linear Regression was Used to Screen CO_2-Driven Reservoirs. Oil Gas Res 8: 241.