

Study of the cyclic injection of CO₂ in unconventional tight oil reservoirs

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saturation on the oil recovery, in order to advance procedures for planning cyclic injection treatments.

Conclusion

The effect of number of cycles on the oil recovery for the cores saturated with/without water for the core sample that only saturated with oil, one can observe that the highest oil recover was at the first two cycles at average of 21.66% (the recovery factor was 37.43% and 59.09% respectively) for the 15 minutes of production. However, the oil recovery factor then slightly increased after the second cycle until it reached the value of 77.74% at the end of the fourth cycle. For the production time of 30, 60, 90 and 120 minutes, the oil recovery factor was 41.24, 43.86, 46.37 and 49.18% respectively, and it increased at the average of 8.41, 8.37, 8.57 and 8.69% at each cycle correspondingly. Similarly, for the core sample that initially saturated with water and then saturated with oil, one can observe that increasing the number of cycles increases oil production recovery. For instance,

the oil recover at the first cycle was of 11.64% for the 15 minutes of production and the second cycle, the oil recovery was of 22.47% which means that is nearly the twice recovery of the first cycle (10.83%). However, the oil recovery while considering water saturation was then slightly increased after the second cycle until it reached the value of 30.40% at the end of the fourth cycle. After the second cycle, the oil recovery factor keeps increasing at average of 4.35% at every cycle. For the production time of 30, 60, 90 and 120 minutes of C-2, the oil recovery factor while considering water saturation was 14.57, 16.95, 18.86 and 21.75% respectively, and it increased at the average of 4.38, 4.54, 4.92 and 4.97% at each cycle correspondingly. Furthermore, the comparison between them, the cumulative oil recovery factor of the fourth cycle for production period of 15 minutes was 77.74% for 30.40% for which means that the oil recovery factor of the core saturated with water and oil dropped to almost 47.34% of the recovery factor of the core that only saturated with oil. Similarly, for the production period of 30, 60, 90 and 120 minutes were dropped 46.81, 46.10, 45.74 and 46.04% respectively.