Contribution ID: **1054** Type: **Poster Presentation**

Research on the occurrence states of microscopic remaining oil in ultra-low permeability reservoirs

Tuesday, 14 May 2024 09:25 (1h 30m)

The Chang 6 reservoir represented by Wangyao Area in Ansai Oilfield is the earliest developed reservoir in Changqing Oilfield. After nearly 40 years of exploration and development, the comprehensive water cut has reached 72.8%, and the degree of geological reserves recovery is only about 17.8%. The reservoir has entered the middle and late stage of development, and the reserve-production ratio has decreased year by year, and the problems of production decline and low recovery degree have become more and more serious. The effect of conventional water flood adjustment and cyclic water flooding are not obvious. So it is necessary to use polymer injection, phlogisticated air injection and carbon dioxide injection to enhanced oil recovery. However, due to the great differences in the micro-pore structure of the reservoir, the location and shape of the micro-remaining oil are different, and the corresponding tapping methods for different types of micro-remaining oil are also significantly different. Therefore, it is necessary to carry out systematic water drive experimental research on the ultra-low permeability reservoir whose micro-remaining oil occurrence characteristics and production mechanism are not completely clear at present. In this study, the ultra-low permeability lithology reservoir of Chang 6 formation in Ansai Oilfield was taken as the research target area. By using the dynamic displacement scanning technology to obtain two-dimensional image information of micro-plunger core in different water flooding stages, and reconstruct the occurrence states of micro-remaining oil in three-dimensional pore space, and the types of micro-remaining oil were divided and quantitatively calculated according to its formation mechanism and three-dimensional structural parameters. Furthermore, the types and dynamic changes of micro-remaining oil in different water drive stages are analyzed, and the potential of micro-remaining oil in different development stages and corresponding utilization methods are defined, in order to provide theoretical guidance for the smooth implementation of water drive and tertiary oil recovery in ultra-low permeability reservoir.

Acceptance of the Terms & Conditions

Click here to agree

Student Awards

Country

China

Porous Media & Biology Focused Abstracts

This abstract is related to Porous Media & Biology

References

[1] HOU J., QIU M., LU N., et al. Characterization of residual oil microdistribution at pore scale using computerized tomography[J]. Acta Petrolei Sinica, 2014, 35(2): 319-325. [2] SUN X. Application of nano-CT technology to the study of distribution patterns and quantitative analysis in microscopic residual oil after water flooding and quantitative analysis[J]. Journal of Chinese Electron Microscopy Society, 2015, 34(3): 216-221. [3] LI J., JIANG H., WANG C., et al. Pore-scale investigation of microscopic remaining oil variation characteristics in water-wet sandstone using CT scanning[J]. Journal of Natural Gas Science and Engineering, 2017, 48: 36-45. [4] LI J., LIU Y., GAO Y., et al. Effects of microscopic pore structure heterogeneity on the distribution and morphology of remaining oil[J]. Petroleum Exploration and Development, 2018, 45(6): 1043-1052. [5] CHEN Y., JHA N. K., AL-BAYATI D., et al. Geochemical controls on wettability alteration at pore-scale during low salinity water flooding in sandstone using X-ray micro computed tomography[J]. Fuel, 2020, 271: 117675. [6] GAO W., LI Y., HE S., et al. Classification method of occurrence mode of remaining oil based on fluorescence thin sections[J]. Acta Petrolei Sinica, 2020, 41(11): 1406-1415.

Conference Proceedings

I am not interested in having my paper published in the proceedings

Primary author: DONG, Huaimin (Chang'an University)

Co-authors: Dr CHI, Peng (China University of Petroleum (East China)); Dr DAI, Bo (No. 1 Oil Production Plant, Changqing Oilfield Company, PetroChina); Mr ZHUANG, Jian (No. 1 Oil Production Plant, Changqing Oilfield Company, PetroChina); Dr CUI, Likai (Institute of Unconventional Oil and Gas, Northeast Petroleum University)

Presenter: Dr CHI, Peng (China University of Petroleum (East China))

Session Classification: Poster

Track Classification: (MS19) Elastic, electrical, and electrochemical processes and properties in porous media