Geophysical Research Abstracts
Vol. 21, EGU2019-15581, 2019
EGU General Assembly 2019

Study on the development characteristics of effective fractures and in-situ stress-The key to efficient development of bedrock reservoir

Wang Zhaosheng (1), Zeng Lianbo (1), and Meng Ningning (2)
(1) China University of Petroleum, (2) North China University of Science and Technology

The reservoir performance of bedrock reservoir mainly depends on the intensity, connectivity and spatial distribution of the effective fractures, and the seepage capacity of these effective fractures is specifically influenced by the orientation and magnitude of the in-situ stress. Therefore, the study on development characteristics of effective fractures and the in-situ stress is very important for the efficient development of bedrock reservoir. Taking the bedrock fractured reservoir of West margin in the Qaidam Basin, China as an example, the development characteristics of effective fractures with different scales (large-scale, medium-scale and micro-scale) was analyzed using date from outcrops, cores, image logs, thin sections and production testing. The methods of induced focal mechanism solution, caliper caving and acoustic emission experiment were used to the constrain the in-situ stress, and the distribution of the in-situ stress was simulated using the finite element method. The results show that the fractures were formed in two periods in the study area. The fractures of the first period are E-W trending, most of which were filled with minerals. The effective fractures are mainly composed of the tectonic shear fractures with high dip angle which were formed in the second period. The preferred orientation of these effective fractures is NNE-SSW trending, which is in accordance with the current maximum horizontal principal stress and is hence the main direction of seepage. However, under the influence of lithology, sedimentary microfacies and tectonic position, the characteristics of fractures and stress distribution in different regions are distinctly different, which is also verified by the water injection dynamics. Therefore, in order to improve the productivity of bedrock fractured reservoir, it should pay more attention to the spatial variation of effective fractures and in-situ stress, which can help to arrange the wells location and make development plans reasonably.