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Qi Li¹, Renhua Kang² (1) China University of Geosciences, Wuhan, Hubei Province, China (2) Shengli Petroleum Administration Bureau, Dongying City, Shandong Province, China

Distribution and Origin of a Reservoir in Igneous Rock, Zhanhua Seg, Eastern China

Igneous rock oil and gas pools are increasingly of interest. We studied the diabase reservoir of Luo151 area in Zhanhua Seg, Eastern China, including petrologic and lithofacies analysis, reservoir anisotropy, geological modeling, and igneous reservoir synthesis evaluation. Based on analyzing petrology, texture and structure, 4 lithofacies zones are divided in the diabase and wall rock. These are a carbonaceous slate subfacies, hornfels subfacies containing cordierite and grammite, border subfacies and central subfacies. The petrologic types include carbonaceous slate, hornfels, and diabases. There is anisotropy in the diabase reservoirs; fracture is the primary reservoir porosity, which is dominated by oblique tensile fractures. The fracture zones are mainly developed in joint belts in igneous rock and wall rock where rock layer thickness changes rapidly. Based on geological and seismic data, the horizon of igneous rocks is demarcated accurately by using VSP and synthetic seismograms, and the shape distribution and continuity of igneous rocks are determined by using cross-hole seismic technology. The reservoir capability is predicted by using logging constraining inversion and neural network technology. An integrated method to predict igneous rock oil and gas pool is proposed.