Characterization and Geological Model of Fractured shale Reservoir in Eastern China

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Almost all fractured shale reservoirs are distributed in source rocks which are mainly composed of mudstone and shale, abundant in organic matter, calcareous and siliceous minerals. Compared with sandstone and Carbonate reservoir, Shale reservoir with strong plasticity has common and specificity on fractures type and origin, identification method, parameter estimation, and distribution prediction. The shale reservoir fractures can de-classified into two groups of fracture according to their origin, structural and non-structural fracture. Structural fracture, including high-angle shear fracture, tensile and shear fractures and low-angle slip fracture, belongs to ductile shear fracture. Non-structural fracture in shale, more developed than other types of lithology, such as shrinkage fractures, overpressured fractures and weathered fracture, resulted from diagenesis, drying crack, overpressure, mineral phase transformation, recrystallizaion, and pressure-solution. The shale reservoir was almost formed in lacustrine lamellar marl in the deep lake environment. The endogenetic action for forming and growing mudstone fractures includes high content of organic carbon, moderate mixing ratio of formations and burial depth, predominant formation combination. The ectogenetic action for forming mudstone reservoir is the special structural environment. The srtuctural fracture and hydrocarbon generation fracture are the main space for oil accumulation and the percolation channel for mudstone reservoir. The disappeared edge, intersection zone and outside zone of faults are the growing areas for mudstone reservoir. Then it is summarized the methods of fracture identification parameter estimation, fracture reservoir distribution prediction using geological seismic, drilling and logging and structural stress, and then propose current problems and trend of study on shale fracture reservoir.

References

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