Gold Oil Field Reservoir Characteristics

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***Abstract*—Reservoir characteristics has always been one of the many core study petroleum geology, it is because the reservoir is the exploration and development of the most immediate target layer, gas-water as the fluid, they exist and sports venue is the reservoir, thus storage layer of oil and gas reserves, production and production capacity of close relationship. Whether the study area reservoir layer distribution in the longitudinal direction or in the plane of the distribution are controlled by sedimentary facies, reservoir properties, lithology distribution varied, showing a strong heterogeneity characteristics. Reservoir characteristics are the basis to make oil exploration and development programs, as well as evaluation of the reservoir, discovered important credentials and its capacity to predict potential ultimate recovery.**

Keywords-reservoir characteristics; gold belt oilfield; physical properties; heterogeneity

I. INTRODUCTION

Reservoir rock and mineral composition, and arrangement of particles cemented manner often determines the quality of reservoir properties. It is characterized by the reservoir rock is to determine the reservoir pore throat type, diagenesis, pore structure and reservoir properties of the foundation.

Through the study area coring lithology statistical analysis, gold belt oil reservoir lithology is mainly conglomerate, brecciated sandstone, sandstone, ranging from grain sandstone, fine sandstone, siltstone and argillaceous siltstone seven categories. Also, according to the study area statistical sample drawn get gold flakes with oil sands mineral composition triangular diagram, we can see gold with oil reservoir lithology is mainly feldspathic sandstone, lithic feldspathic sandstone and a small amount of lithic sandstone.

Detrital mineral composition is based on quartz and feldspar, their average content of 37.5% and 36.7%. Wherein the quartz content is generally between 30% to 45%, feldspar content is generally between 35% to 48%, in addition, debris content of between 5% to 13%, with an average content of 12.1%; clay content in between 7% to 11%, with an average content of 8.3%. There orthoclase feldspar, plagioclase feldspar and three, most of sandstone with orthoclase and plagioclase-based, and the positive content of feldspar is higher than the plagioclase; content less debris, debris to neutralize the acidic volcanic majority. Argillaceous cement, followed by the carbonate. Analysis of the results indicated by the statistics three wells 16 X-ray diffraction of clay minerals, clay minerals dominated by kaolinite, illite, chlorite and illite mixed layer and the like mineral makeup, the most important is kaolinite and chlorite.

II. RESERVOIR PHYSICAL PROPERTY CHARACTERISTICS

Studies features one very important part of the reservoir is a reservoir study. Reservoir parameters for quantitative research, analyze their variation in the plane and the vertical line are the reservoir facies, reservoir heterogeneity research and calculation of reserves, production testing, reservoir comprehensive evaluation has a very important meaning, will form the basis for study of the distribution and movement of water remaining oil. So it has great significance for oilfield exploration and development.

Physical properties of reservoir mainly refers to the reservoir porosity and permeability. Porosity affects the number of major oil and gas reservoirs, and permeability directly determine the level of oil and gas production. Both directly through core test, of course, can also be obtained through a large number of logging data indirectly. In this study the macroscopic reservoir characteristics, we mainly use the core test data, because the core analysis is the most accurate, most intuitive physical property evaluation.

III. RESERVOIR MICROSCOPIC CHARACTERISTICS

A. Reservoir Space Types

Prerequisites reservoir reservoir space is formed, it is the result of the combined effects of diagenesis, sedimentary, tectonic and so on. Reservoir space is usually divided into pores, cracks and holes in three categories. For clastic reservoir pore space is more than that within the reservoir. In this study, sandstone porosity and permeability is better, and therefore reflects the main oil reservoir porosity segment is based, so in this article relates to the reservoir space refers to the reservoir pore type. Primary pores between the Fingered detrital particle porosity, pore size and abundance of native determined by the deposition conditions, all deposition process. Primary pores contain particulate support among the rocks in the grain pores and matrix of micro pores, the former is based. Primary porosity evolution irreversible, meaning that after the loss of primary porosity is no longer restored. Secondary porosity is the pore diagenesis stage produced each period is after the formation of sedimentary rock, due to the dissolution, pore leaching, accountable, dissolution, recrystallization and so on in the rock formation, seams and holes, this abundance and size of the pores is generally controlled by the dissolution. And primary porosity different secondary porosity evolution is a repetitive and reversible after primary or secondary porosity was blocked, diagenetic In a separate incident can re-acquire all or part of. In the process of diagenesis, the rock through compaction, pressure solution and cementation, making primary intergranular pore becomes

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gradually reducing residual intergranular pore, while soluble cement and soluble detrital the account with the depth of the increase occurred and dissolution, to promote the development of secondary porosity in clastic rocks.

B. Pore Structure Characteristics

Microscopic pore structure is actually the physical properties of rocks, which is more comprehensive than the conventional physical properties, more in-depth understanding of the reservoir permeability, production and reservoir performance.

Reservoir in the study area belong to the rapid accumulation of sedimentary instability, which is mainly reflected in the low maturity of reservoir rock structure, filling the obvious heteroaryl, high debris content, provenance closer. Reservoir rock reservoir space can be divided into two types of pores and throats, the two constitute the two basic factors of the pore structure of the combination on the whole they determine the reservoir characteristics. Which means the larger pore spaces between rock particles, and the throat is narrow passage between rock particles. Porosity of the rock main reservoir space is used to store fluid in the rock; a major role in the throat is controlled by the ability of the fluid is the main channel of the fluid. The pore size will affect the porosity reservoir, and the size and connectivity of the throat and will directly affect the effectiveness of reservoir permeability. But having the same reservoir permeability and porosity often have different recovery and production capacity, it is because in addition to oil and gas output capacity by porosity and permeability control, but also largely owned by the rock porosity and size of the throat, geometry, distribution, interconnected, configured and its evolution of the relationship - the control of micro pore structure.. Throat with different sizes and shapes can produce different capillary force, thereby affecting the performance of the reservoir permeability and porosity to a large extent. Reservoir pore structure determines the residual oil in porous media dependency status and distribution, and pore viscous forces and capillary forces will decide to transport residual oil.

IV. RESERVOIR HETEROGENEITY

Marine reservoir due to sedimentary environment, material supply, hydrodynamic conditions and other factors diagenesis on the reservoir has a very uneven changes and significant differences in terms of lithology, physical properties, occurrence, internal structure, which changes and the difference is called the heterogeneity of the reservoir.

For a reservoir reservoir heterogeneity can roughly be characterized by three levels: the first level is the inner layer is made of sand inside rhythmic, sedimentary structures and sedimentary structures due to heterogeneity; The second level is the oil interlayer heterogeneity scale phase deposition Tibetan cause; and the third level is the heterogeneity of the reservoir scale plane microfacies and sand body cutting overlapping relationship and phase transitions caused; specifically described as follows:

Internal heterogeneity: prosodic features including size and permeability, penetration degree of difference in the distribution and discontinuous thin layer laminated shale and the like.

Interlayer heterogeneity: interlayer porosity, permeability and permeability changes in the degree of heterogeneity and the like.

Plane Heterogeneity: Changes main reservoir flat shape and thickness distribution.

continental oilfield is a significant feature of polycyclic sandstone and mudstone, more rhythmic, quick plane change caused by oil and gas reservoirs serious heterogeneity, which is affecting the permeability, high-yielding oil field waterflood development duration, ultimate recovery level and one of the main factors of remaining oil distribution. Thus, in recent years the reservoir heterogeneity research has become the core of reservoir description and reservoir characterization. In particular reservoir sand body geometry, size, inner impermeable blocking layer and permeability heterogeneity is the direct controlling fluid flow and flooding of the main factors.

V. CHARACTERISTICS OF RESERVOIR DISTRIBUTION

A. Longitudinal Characteristics

In the longitudinal direction of the distribution of oil reservoir gold with a strong horizon characteristics.

Through the reservoir statistical study area and analyzed according to the thickness of each layer of the phase comparator, and then the same layer in different zones were compared, some sand source area from the northwest to the southwest area of the reservoir layer thickness is gradually decreases.

Gold Oil Field in Dongying period, a sand and depositional environment of sand three different periods, so the degree of development are not the same sand, sand reservoir section most developed, most of Reservoir in Es3 not developed. Sand long-term development, mainly for thin single sand body thickness of between more than 1-8m.

B. Planar Features

On the plane, in the study area fan delta front sands and flood plain sand bodies are very different, so the gold with oilfield in Dongying group, some sand and the sand on the three sections of the reservoir plane also showed a big difference sex. By analyzing various small sand layer thickness map, physical contour map, you will find the gold deposited with a plane change and oil reservoir facies changes in good agreement..

Dongying sand and sand distribution group distribution of sand roughly the same period, but the former sand distributed more widely From the three-stage plan sandstone Sec East and East can be found in the study area showed a larger north-south development sand thickness, the central characteristic of thin sand bodies, within the group of sandstone, sand thickness is generally less than 4m. Takes the shape of a strip north of the thick layer of sand distribution, it takes the shape of a sheet thick layer of sand southern distribution.

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Fan delta front sand a period subfacies underwater distributary channel sand thickness frequent cause rapid changes in the plane, usually the main part of sand thickness, both sides gradually thinning. Channel and mouth bar sands banded or patchy distribution; a thin layer of sand between the river and the leading edge of a thin layer of sand presented sheeted distribution. Sand previous period due to the influence of the deposition conditions and more volcanic activity, the development of the small layer of sand is also very different circumstances: water into the period, expanding lake points, poorly developed sand body distribution area smaller; water off period , sand-developed, widely distributed area.

Grain of sand on the development and distribution segment of sand deposition conditions are still being closely affect change. Overall, the development of the northern region is relatively simple sand, sand thickness is small, with an average of about 4 ~ 8m; Central thinnest sand thickness on average less than 4m; while in the south the best sand development, patchy distribution, The average thickness of greater than 10m.

VI. CONCLUSION

Through careful study of the characteristics of the gold band Oilfield carried out and its comprehensive evaluation, the paper obtained the following conclusions:

1. Research area reservoir rock types are mainly feldspar lithic sandstone lithology is mainly fine sandstone and in - coarse sandstone, conglomerate. Detrital sorting etc. - sorted, roundness medium is once more pointed - times circular, composition and structure of the reservoir low maturity - medium-distance transport, detrital material experienced closer, degree by the general transformation of detrital grains.

2. The gold band reservoirs are mainly in low permeability reservoir hole, but on the reservoir properties of each interval showed a greater difference, where Dongying group mainly high hole high permeability reservoirs, one on the sand high porosity and low permeability reservoirs in the sand in the hole for a class of reservoir permeability, reservoirs and sand at low porosity and low permeability, sand three period mainly low porosity and low permeability. The porosity and permeability of the study area gradually decreases with increasing depth, but there is a return of the phenomenon in 2400 ~ 2800m segment, porosity and permeability of 2% to 3% increase in value.

3. Gold with oil reservoir pore type intergranular pore and dissolved pore-based, micro-pore and fracture followed; throat partial small, medium pore throat structure, belonging to the microscopic pores in the low permeability of the throat and other communication-oriented the reservoir.

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