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The hydrocarbon accumulation regularity and control factors of Daliuquan and Hexiwu tectonic belt in Es3 formation

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Abstract: In order to research the hydrocarbon accumulation regularity and predict the favorable zones of the mid-sha3 member in the Daliuquan structure belt, the hydrocarbon distribution regularity of 154 traps and more than 170 wells in this area has been analyzed. he oil source faults are the main oil and gas migration to the reservoir and source rock and the fault of the time-space matching relation. The regional caprock is the prerequisite for oil and gas preservation (change), and the time-space matching relation between faults and controls the oil and gas accumulation horizon. Nearing the oil source faults are intensive belt are favorable for shahejie formation oil and gas accumulation. The sand ground than size controls the degree of lateral distribution.

I. INTRODUCTION

Langgu sag is located in the northern Hebei central depression, Bohai bay basin by the ancient near east west is broken, the south north, north east to distribution of basket depressions. Daliuquan nose-like structure belt and Hexiwu fault belt in south-central gallery solid sag, exploration area of 822 km^2, Daliuquan - Hexiwu by gallery solid sag tectonic belt, complex geological conditions, large exploration potential. Predecessors in gallery solid depression has done a lot of research on hydrocarbon accumulation, have also made some very meaningful, but limited information and research techniques, knowledge of oil and gas enrichment regularity is not yet perfect, accumulation and its control factors collocation relation is not clear, not effectively guide the oil and gas exploration in the study area

The distribution pattern of hydrocarbon

Daliuquan nose-like structure belt in the stone house, LiuQuan, fork, wang ju, housework, amber, amber battalion north, cao old state, stone Buddha temple, the cpmpany and cpmpany east 11 local anticline, fault nose structure composition, HeXiWu structural belt by HeXiWu east west base, the base and base with three broken base band. Statistics 373 well logging, well logging and testing data, which the 184 as well. Plane, in addition to the cpmpany anticline, enrichment of oil and gas mainly in fracture tectonic belt of the main body, along the old state is a zonal distribution. Vertical, the enrichment of oil and gas distribution is mainly under the regional caprock of sand under 3, paragraph. Therefore, Daliuquan structural belt has the obvious planar zonation, oil and gas distribution characteristics of vertical stratification.

HeXiWu tectonic belt slope area within the source, the part of oil and gas from the source reservoir fracture caused by docking, vertical migration of part comes from the source faults, the broken base with nuclear enrichment degree highest, ns zonal distribution. HeXiWu west base belt, a series of north west Es3x source rocks and the consequent fault E4s reservoir, formation is broken - sand transportation systems, the broken base with core by reverse fault block reservoir. HeXiWu base belt and the eastern base belt, south west to the east big Meng Zhuang subsags and tung subsags Es3, Es4 source rocks under the hydrocarbon source rock, oil and gas along the vertical migration of oil source faults first, and then along the sand body, lateral migration in the broken base with nuclear department gathered into hiding.

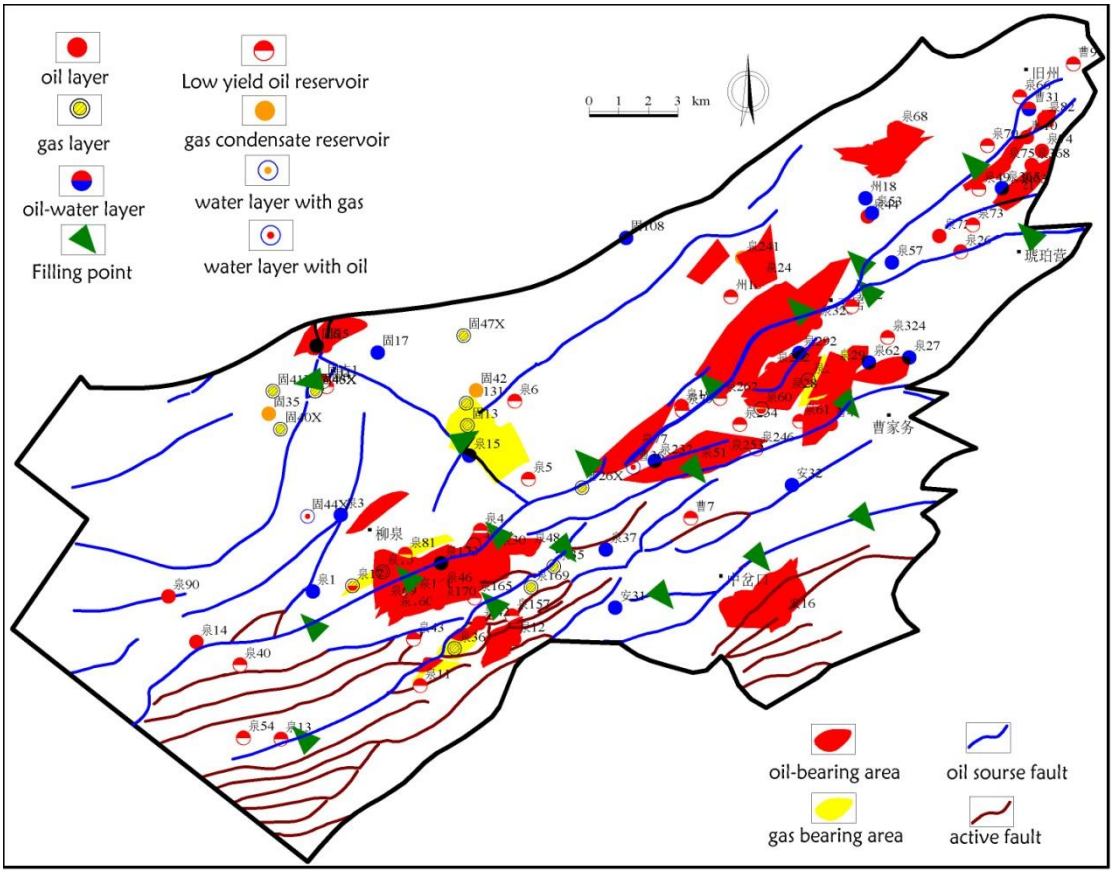

Fig.1: the traps, oil source faults, migration path and the hydrocarbon distribution of Daliuquan tectonic belt

II. THE MAIN CONTROLLING FACTORS OF HYDROCARBON ACCUMULATION AND DISTRIBUTION

2.1 The oil source faults are the main oil and gas migration to the reservoir and source rock and the fault of the time-space matching relation

Corridor sand three solid sag, the distribution of effective source rocks of district and the can for three times or more in the sand for hydrocarbon reservoir; Sand 4 under the scope of effective source rocks in the Daliuquan nose-like structure belt, South Korea village subsags and HeXiWu fault belt (mainly distributed in HeXiWu), for rock HeXiWu Duan Youxiao for hydrocarbon. Integrated structural evolution and fluid inclusion data, Daliuquan HeXiWu sand source rock is a large amount of hydrocarbon expulsion period 2 until the end of guantao. But by 3 sand reservoir with underlying sand on three of the four source rock and sand sand reservoir with the underlying source rock under 4 apart between multiple sets of mudstone layer, so the latter generation of oil and gas migration can't through the formation of pore former, can only make its migration to by fracture reservoir of sand sand 3 and 4. Oil and gas migration tracer shows that Daliuquan with HeXiWu tectonic belt are mainly composed of vertical migration of oil and gas, through to the large areas of oil and gas migration path of LiuQuan surface characterization, its lateral distribution distance is short, generally no more than a fault spacing, oil and gas.

2.2 The regional caprock is the prerequisite for oil and gas preservation (change), and the time-space matching relation between faults and controls the oil and gas accumulation horizon

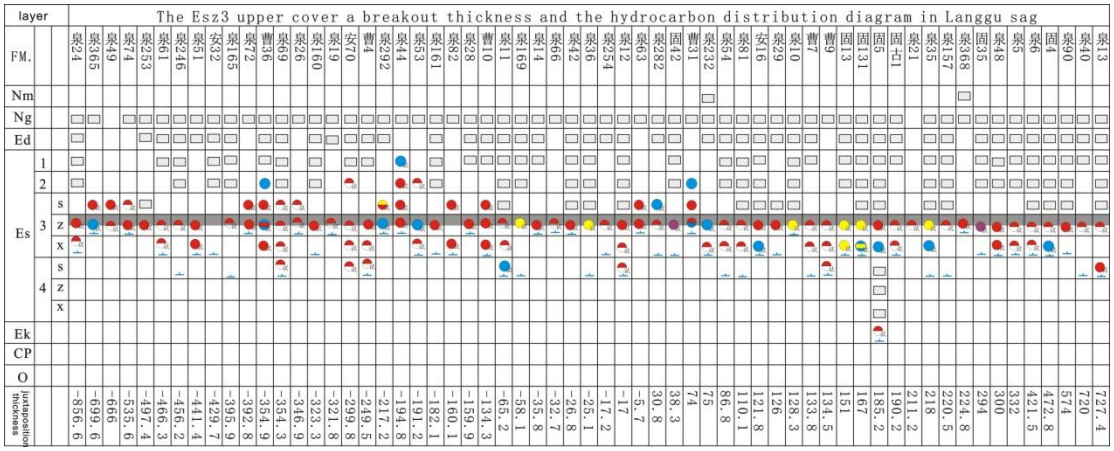

Fig.2 Set figure of the biggest fault damage degree required to seal oil and gas migration in Es3z of Daliuquan area

Due to the Daliuquan and HeXiWu tectonic belt, abnormal fault cap rock quality, thickness, continuity, and distribution of oil and gas from escaping degree and the reservoir preservation conditions have a decisive influence. Major development in the study area of sand under the three middle uppers, the sand a period of two sets of regional cap rock and sand lower dongying group two sets of regional cap rock

Cap space distribution continuity depending on whether the later destroyed by fracture and damage, if completely break the cover layer stagger (that is, the fault slip is greater than the cover thickness), then the distribution of the cap will lose continuity, completely sealing ability of oil and gas; If fracture cannot cover completely staggered fracture slip (i.e., less than the cover thickness), then the caprock distribution is continuous, effective thickness, the size is equal to the original thickness of cover less fault slip) thin. Such a case, although caprock distribution is continuous, but effective thickness thinning, sealing capacity

2.3 Nearing the oil source faults are intensive belt are favorable for shahejie formation oil and gas accumulation

Gallery of solid sag sag is closely related to the amount of oil and gas distribution and fracture density, but not all the fracture density bring are all in oil and gas distribution and only near the fracture density is on the positive construction of oil and gas distribution. Depending on the type of positive structure is divided into collapse anticline belt, back broken nose belt and faulted anticline. The company anticline faulted anticline belt; Old fracture for back tilt nose broken belt, west of state by the old state, fracture and a series of small reverse fault clamping, mainly by oil source faults of old fracture state oil supply, reverse formed small fault block reservoirs; Old state east of fracture collapse anticline belt, is by the old state of fault and amber camp fault, the king of the fault, the fork in the fault, Yang tax fault, LiuQuan fault oil source faults such as clamping, dual-source oil supply and collapse anticline belt inside a series of small fault block oil and gas formation, so the highest degree in oil and gas enrichment

2.4 The sand ground than size controls the degree of lateral distribution

Is mainly controlled by hydrocarbon accumulation horizon of formation sand ratio, formation sand to the higher than, show that the sandstone is development, also the reservoir development, the more beneficial to oil and gas lateral filling and reservoir development, conversely for oil and gas in the assembled into hiding. Formation of the higher than sand, suggests that the mudstone, the less development fault zone formed in the

process of fracture development in the lower the shale content, lateral sealing ability of fault is the worse, the more oil and gas to the formation of lateral distribution and aggregation accumulation; Instead, than the lower stratum of sand, show that the development of the mudstone, fracture development in the process of formation of the higher the shale content in fault zone, the lateral sealing ability of fault is, the better, the more unfavorable to oil and gas to the formation of lateral distribution and accumulation.

III. CONCLUSION

1. Daliuquan structural belt has the obvious planar zonation, oil and gas distribution characteristics of vertical stratification.
2. The oil source faults are the main oil and gas migration to the reservoir and source rock and the fault of the time-space matching relation
3. The regional caprock is the prerequisite for oil and gas preservation (change), and the time-space matching relation between faults and controls the oil and gas accumulation horizon
4. Nearing the oil source faults are intensive belt are favorable for shahejie formation oil and gas accumulation
5. The sand ground than size controls the degree of lateral distribution.