Has been recognized that oil and gas is common in the mud shale and oil volume is mainly influenced by geochemical characteristics of source rock (the abundance, type and maturity), workability mainly influenced by reconstructive fracturing of rock. Now the ministry of land and resources strategic research center and the main oil and gas fields are carrying out the resources evaluation in the country and total acreage of shale oil and gas evaluation, preliminary results revealed that Chinese continental shale contains huge amounts of shale oil resources, such as Qing 1 segment in the south of Songliao basin up to 8 billion tons, the bottom of E2S3 segment of south bohai depression in bohai bay basin up to 4 billion tons. But the shale has tight, low porosity, especially low permeability, and the density and viscosity of oil is larger than gas, so oil flows more difficultly than gas in the underground. The key to restrict the effective of shale oil exploration and development is not the oil volume of the shale, but how much mobile (recoverable) ability in it, therefore, shale oil mobility evaluation is critical.

In theory, classification of shale oil and gas resources should be based on the enrichment degree and the workability of oil and gas, but as a result of oil and gas (economic) workability is related to technology, the price of oil, and so on. The degree of enrichment is the basis and premise of (economic) workability, therefore, regard the enrichment of oil and gas as the first element of grading resource evaluation. The division of enrichment period is according to the relationship of geochemistry parameters in abundance of organic matter, the division standard is as follows:

Based on TOC — chloroform bitumen "A" and the TOC — pyrolysis S1 scatterplot (Fig. 1), chloroform bitumen "A" and pyrolysis S1 increases along with the TOC, while the process of increasing has three stages, divided into stable low section, rising section and stability section of high value. On this basis, I draw the envelope curve of the TOC — chloroform bitumen "A" and the TOC — pyrolysis S1 scatterplot and determine the TOC boundaries between the three sections, as the TOC classification standard of resource grading evaluation of shale oil, stable low segment is dispersion (invalid) resources (level III), the rising of inefficient resource (level II), stability of high value is the enrichment resources (level I). The turning point between the stabilize low and rise sections of the envelope curve and the midpoint of rising section correspond to the boundaries of the chloroform bitumen "A" and the pyrolysis S1, and draw the boundaries as the chloroform bitumen "A" and pyrolysis S1 classification standard, if the application in the process of TOC, chloroform bitumen "A" and pyrolysis S1 classification standard appeared antinomy, the TOC classification standard shall prevail.

Due to the particularity of the object and the lack of experimental instrument which is specific to the object, the related research lags behind. And the theory, method and experiment are lagging behind the exploration and practice. It is generally acknowledged that the higher is the abundance of organic matter in mud shale, the greater is the amount of shale oil, but it should not be ignored that the more is organic adsorption of oil. Whether adsorption oil can be desorbed and the amount of the movable oil linear increases with the organic matter abundance or not, how to evaluate them in the experiment or in the method, there is no related reports. Foreign scholars, according to the exploration and practice of shale oil wells, put forward that if 100 x S1 / TOC of mud shale section is greater than 100, this part is the good shale oil output interval.

Mud shale entering the hydrocarbon expulsion threshold means the raw hydrocarbons have made the shale reach
the saturation of hydrocarbons, and continually generated hydrocarbon can discharge. But because of the influence of conditions of hydrocarbon expulsion, there are quite a lot of hydrocarbons still stranded in it. This part of the hydrocarbon is available for our production. The Damintun hydrocarbon expulsion threshold determined by geochemical method is 2500 m in depth. So we can determine the corresponding movable oil minimum standards, namely movable criteria of shale oil (Fig. 2), envelope value in the figure is about $S_1 / TOC \times 100 = 30$. In the process of movable oil calculation, I use two-thirds of the envelope value as a standard to calculate, namely the $S_1 / TOC \times 100 = 20$ as movable resources standards. The standard of the Damintun shale oil mobility is determined by the hydrocarbon expulsion threshold. The restored $S_1$ minus the immobile oil is movable oil. We evaluate the resources strength of the different levels of movable shale oil in different layers of sag by the volume method, calculation of the movable resource of the top of $E_2S_4$ is about 13 million tons, and the bottom of $E_2S_4$ is about 31 million tons.

References
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