DOI: 10.21276/sb.2016.2.6.23

Scholars Bulletin
(A Multidisciplinary Journal)
An Official Publication of "Scholars Middle East Publishers",
Dubai, United Arab Emirates
Website: http://scholarsbulletin.com/

ISSN 2412-9771 (Print)
ISSN 2412-897X (Online)

Evaluation on Dalong Formation Hydrocarbon Source Rock in the Northwest Sichuan Province

Zhang Bing
Northeast Petroleum University, Daqing, Heilongjiang, China, 163318

***Corresponding Author:**
Zhang Bing
Email: 931449651@qq.com

Abstract: The best source rocks, is a prerequisite for further oil and gas exploration in the sedimentary basin, hydrocarbon source rock evaluation of oil and gas migration, accumulation, basic research. The Permian reservoir in the Northwest Sichuan Basin has two sets of source rocks, source rocks for the two Permian Qixia and Maokou group, the other is a two Permian hydrocarbon source rocks in Dalong formation, compared with the two Permian source rocks, with its geochemical characteristics and geological significance of hydrocarbon formation in source rocks. For this reason, the type from the source rocks of Dalong formation matter abundance, starting with the maturity, chemical parameters of the earth, to conduct a comprehensive evaluation. In the northwest of Sichuan two Permian Dalong formation source rocks, the average organic matter content rich, high abundance of organic matter (average 5.68% TOC), good organic type (I - II_1), a high degree of thermal evolution, and source rock is mature. (average Ro 0.87%), and the comprehensive evaluation of the hydrocarbon source rocks is a good source rock.
Keywords: hydrocarbon source rock; Dalong Formation; Upper Permian; northwest Sichuan Proccince.

INTRODUCTION

The development of high quality and effective hydrocarbon source rocks in sedimentary basin further oil and gas exploration in the prerequisite. Therefore, geologists through the hydrocarbon source rock organic geochemical characteristics, characteristics of the thermal evolution of hydrocarbon source rocks and good hydrocarbon source rock development leading factors, a large number of studies, and for the follow-up of the oil and gas exploration to provide strong support.

Hydrocarbon is rich in Northwest Sichuan region source: the main hydrocarbon source rocks of Permian and Silurian and Cambrian and Sinian system, the Permian has two sets of hydrocarbon source rock, hydrocarbon source rock Lower Permian Qixia and Maokou Formation, the previous studies that the sets of hydrocarbon source rock is the main supply source. Another set of two Permian Dalong formation hydrocarbon source rocks, with respect to the lower Triassic hydrocarbon source rocks, Dalong formation hydrocarbon source rock has its own geochemical characteristics and oil and gas geological significance [1]. From the type of organic matter abundance, hydrocarbon source rocks of the Dalong formation, with the maturity of the chemical parameters of the earth, to evaluate it.

ORGANIC ABUNDANCE

Organic matter abundance is the most basic index for the evaluation of hydrocarbon source rocks. With the content of organic matter abundance is the evaluation of the hydrocarbon source rocks of the basic indicators. In the normal thermal evolution conditions, the total organic carbon (TOC), bitumen "A", the hydrocarbon generation potential (S_1+S_2) and total hydrocarbon is the evaluation of the hydrocarbon source rock organic matter abundance of conventional indicators. But the high evolution, hydrocarbon generation potential bitumen "a" basic failure, total organic carbon (TOC) become the evaluation of hydrocarbon source rocks hydrocarbon potential of the main indicators of marine hydrocarbon source rock evaluation, often organic matter type is better (I - II), total organic carbon (TOC) >2.0% (mature stage > 1.5%) of the hydrocarbon source rocks of classified high-quality hydrocarbon source rocks [2].

Select in Northwest Sichuan different profile Dalong formation hydrocarbon source rock samples in total 34, in which TOC reached 21.5%, with an average of 5.68% (Table 1), the 85% of the sample TOC reached more than 2.0%; raw hydrocarbon generation potential (S_1+S_2) 0.09mg/g~51.62mg/g, average value for 11.23mg/g, indicating the good good hydrocarbon generating potential; hydrogen index (I_H) are higher, mainly for high-quality hydrocarbon source rocks.

Table 1: The organic abundance in northwest Sichuan

Profile	TOC（%）	S1+S2(mg/g)	IH(mg/g)
Guohua	0.84～6.45	0.09～0.42	3.26～11.86
	3.56（6）	0.23（6）	7.34（6）
Cazuba	0.25～17.2	0.16～20.58	34.15～140.39
	6.18（21）	6.93（21）	97.18（21）
Jianfeng	2.64～5.96	7.18～17.66	265.15～286.41
	4.3（2）	12.42（3）	275.78（2）
Qinggangpo	1.79～21.5	3.37～51.62	172.82～376.57
	8.67（5）	25.33（5）	259.68（5）
the meaning of the date	MIN～MAX AVG（QTY）		

ORGANIC TYPES

According to the results of rock pyrolysis analysis can determine the type of kerogen. S_1, S_2, S_3 were divided by the rock of the organic carbon content of three indicators respectively (I_{HC} = S_1/TOC) index of hydrocarbon and hydrogen index (I_H = S_2/TOC) and oxygen index (I_O = S_3/TOC). Rock organic matter index of hydrogen and oxygen index similar to the elemental analysis of H/C and O/C, according to the hydrogen and oxygen index can be divided into the type of organic matter (kerogen). According to the method that the Dalong formation of kerogen type is mainly I - II kerogen type, the type of organic matter is good.

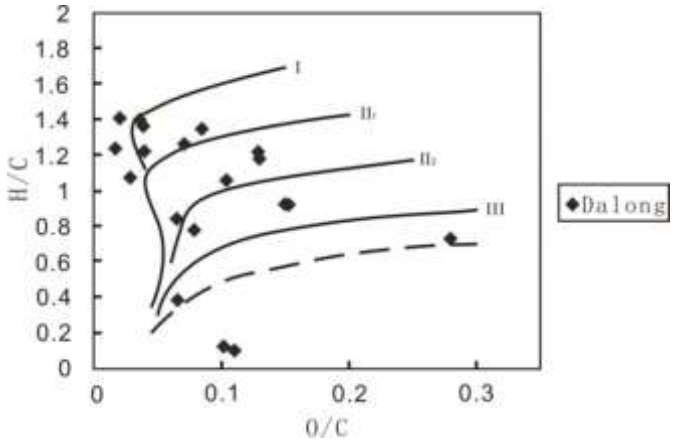

Fig-1: The organic types in northwest Sichuan

ORGANIC MATTER MATURITY

Vitrinite is a group of oxygen rich macerals, peat with relation to the origin of humus composition, with features of the mirror coal. Kerogenvitrinite reflectance (R_O) is the ability of vitrinite reflectance of light, is used to determine the maturation of organic matter is the most effective indicator. The Dalong formation source rock samples in R_O reached the highest value of 0.95%. Hydrocarbon source rock samples in the study area of the Dalong formation in Ro reached the maximum value of 0.95%, the average value is 0.87%,the organic maturity is moderate.

CONCLUSION

The average organic matter content in the Permian system of Dalong group hydrocarbon source rocks in the northwest of Sichuan Basin is rich in, high abundance of organic matter (average TOC was 5.68%), good type of organic matter (I - II_1), a high degree of thermal evolution and hydrocarbon source rock is in the mature stage (average 0.87), comprehensive evaluation of the a good hydrocarbon source rocks.

REFERENCES

1. Fu, X. D., Qin, J. Z., & Teng, G. E. (2010). Evaluation of Dalong Formation source rock in the North Sichuan Basin. *Petrol Geol Exper*, *32*, 566-577.
2. Baiwei, D., & Ming, C. (2008). Characteristics of Upper Jurassic Suowa Formation source rock in the Qiangtang basin of northern Tibet. *Petroleum Geology and Experiment*, *30*(2), 174.