OIL-DERIVED GAS ORIGIN OF JINGBIAN GAS FIELD IN ORDOS BASIN,CHINA-ANALYSIS OF POTENTIAL SOURCE ROCKS

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Introduction

The natural gas of Jingbian gas field in Ordos basin, China is mixed and the origin of oil-derived gas is controversial. Based on determination of composition of source rock-adsorbed gas and carbon isotope, TOC, rock-eval, carbon isotope of kerogen, chloroform bitumen A and determination of natural gas components and stable carbon isotopes, we evaluated the potential of hydrocarbon generating of limestone from Taiyuan Formation in Upper Paleozoic and carbonate rock above and under gypsum-salt bed of Majiagou Formation in Lower Paleozoic. Meanwhile, we compared geochemical characteristics of natural gas and source rock-adsorbed gas.

Conclusions

The results show that source rocks from Taiyuan Formation have a certain hydrocarbon generating capacity, but far less than its proximate C-P coal measure strata. Oil-derived gas was driven to Majiagou Formation by coal-derived gas generated from C-P coal measure strata, which mixed the natural gas of Majiagou Formation. Source rocks from Majiagou Formation above the gypsum-salt bed cannot generate oil-derived natural gas because of their poor hydrocarbon generating potential. Source rocks from Majiagou Formation under the gypsum-salt bed can generate self-stored natural gas reservoir and can be an important field for further exploration and development in the future. Natural gas of Jingbian gas field is mainly from C-P coal measure strata and the oil-derived part is from Taiyuan Formation with a smaller proportion. In this paper, we first proposed the radar chart of carbon isotope to judge natural gas types in China.

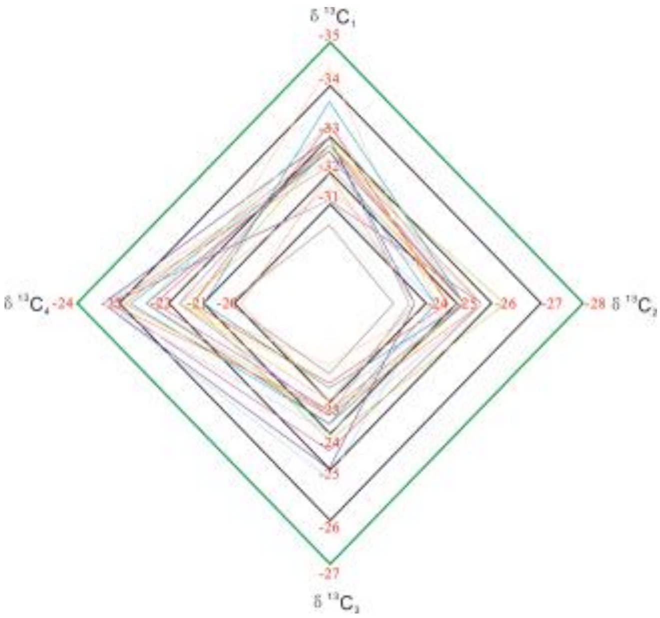

Figure 1 *Radar chart of carbon isotope judging natural gas types*

***Table 1** The geochemical characteristics of source rock-adsorbed gas in Ordos Basin*

Well	Strata	Depth/m	δ13C(‰,VPDB)				Component （%）				
			C_1H_4	C_2H_6	C_3H_8	C_4H_{10}	C_1H_4	C_2H_6	C_3H_8	iC_4	nC_4
S137	P_1t	3478	-34.14	-23.79	−	−	89.01	1.58	7.26	1.48	0.67
Y19	P_1t	2428	-38.37	-25.04	−	−	97.52	2.02	0.29	0.09	0.08
Y60	P_1t	2357	-22.98	-24.00	−	−	97.76	2.09	0.15	−	−
Z5	P_1t	2400	-33.24	-25.72	−	−	95.92	3.37	0.58	0.07	0.06
J1	O_1m	3723	-38.81	-32.30	−	−	97.11	2.28	0.46	0.09	0.06
T38	O_1m	3628	-38.50	-33.76	−	−	98.63	1.18	0.19	−	−
S36	O_1m	2279	-36.21	-30.23	−	−	89.66	7.97	1.21	0.84	0.32
T17	O_1m	3803	-30.58	-31.46	−	−	95.10	2.82	2.08	−	−