Origin of Lower Paleozoic gases in Ordos Basin, China

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Revolutionary New Method

Generally, the $\delta^{13}C_1$ of the lower Paleozoic gas is as heavy as that of the upper Paleozoic coal-derived gas in Ordos Basin, while the $\delta^{13}C_2$ of lower Paleozoic gas is more negative than that of the upper Paleozoic gas, showing a characteristic of oil-associated gas[1].

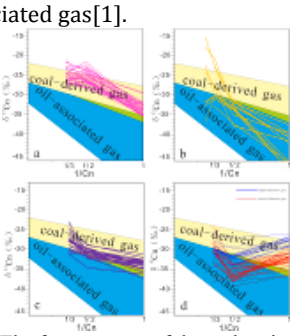

Figure 1: The four patterns of the carbon isotope-type curves of the lower Paleozoic gases in Ordos Basin(based on [2])

Discussion of Results

Based on the carbon isotope data of 154 gas samples and TOC of 733 core samples in Lower Paleozoic strata of Ordos Basin, we divided the gas into four types: the coal-derived gas generated from the upper Paleozoic coaly source rock, the oil-associated gas sourced from the lower Paleozoic source rock, the mixing gas originated from the upper Paleozoic coaly source rock and marine source rock, and the over-mature reversed gas. Moreover, the hydrocarbon generating potential of the lower Paleozoic Ordovician source rock results showed that all the samples have an average TOC of 0.35%, with 19.37% of them having TOC>0.4%. the kerogen type of the source rocks were indicated to be of sapropel type. In conclusion, the lower Paleozoic Ordovician source rock can serve as the source of some lower Paleozoic gas.

[1]Dai et al. (2005) Organic Geochemistry **36**, 1617-1635.
[2] Zou et al.(2007) Organic Geochemistry **38**, 1398-1415.