

The geochemical characteristic of absorbed gas in source rock from Songliao Basin ,China

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Songliao Basin, in the northeast of China, is a large non-marine sedimentary basin in mesozoic-cenozoic. Xujiaweizi fault depression is located in the east of the center upheaval in Songliao Basin. The isotopic composition of natural gas is affected by such factors as the organic type of the source rock, the thermal evolution, and the secondary change after the pool formation. The isotopic characteristics of the individual hydrocarbon are useful geochemical fingerprints to investigate these factors. The individual isotopic composition of natural gas often turns heavier with the increase of the carbon number. However, the isotopic reversals in individual hydrocarbon are very common in the natural gas from deep strata of Xujiaweizi fault depression. The cause of these reversals is not clear now.

We developed two stainless systems, which contained high vacuum crush and could connect with GC-C-IRMS and GC, in order to analyze the individual isotopic composition of absorbed gas in source rock from Xujiaweizi fault depression and its gas composition. The isotopic analysis results showed that the isotopic reversals in individual hydrocarbon occurred in most samples. The gas composition analysis results showed that methane was dominant and less hydrogen with different quantities were detected in most samples. These results indicated some complex factors in natural gas formation in this area. And we inferred that the isotopic reversals might happen originally when the gas was produced by source rock.