

Application of Gas Isotope Geochemistry for Exploration, Production and Operations: A comparison study on tight oil in Delaware Basin and Bohai Bay Basin

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Advances of Gas Isotope Geochemistry heads to the application of conventional and unconventional exploration oil and gas, production of shale oil and gas and even the operation in the geosteering of fieldtrial drilling (Prinzhofer et al., 1997; Ellis et al., 2003; Ferworn et al., 2008; Dawson et al., 2011; Chatellier et al., 2013; Tang et al., 2016).

Accurate and realtime data collection (Stable carbon isotope C1~C3 and composition C1-C6) from the novel field-deployable GCIR2 instrument enables a gas isotope interpretation tool to better understand, constrain and determine the potential targets in tight oil exploration, which has been presented based on realtime fieldtrial experiences in both Wolfcamp Formation in Delaware Basin and Shahejie Formation in Bohai Bay Basin.

These include:

(1) genetic information about the hydrocarbons (both source type and thermal maturity) and a high resolution isotope profile enables this phenomenon to be observed in recently drilled wells

(2) determine the fluid properties based on GOR and predication of geological reasons for fluid property variation

(3) isotopic variation of gas in mud(packs collected) and rockchips(jars collected) and the changes in a time range reaching a brand new level of understanding the petroleum flow types and physical properties in tight reservoir.

References

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