# The characteristics of isotopic composition in the process of natural gas accumulation
# - the migration and accumulation model for carbon isotope reversal

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Stable isotopes and composition study of light hydrocarbons *in high-maturity strata of superimposed basin and high-maturity unconventional gas reservoirs often lead to misjudgments and multiple solutions* about the origins, generation, accumulation and degradation process of hydrocarbons, *especially for the study of* carbon isotopic reversal.

Although many isotope fractionation models have been proposed study the *evolutionary process of hydrocarbon,* (Clayton, 1991; *Tang, et al., 2000*), these models can't accurately illustrate the compositional and isotope variation *of $C_{1-3}$ in geological process. Our model is built by summarizing the general trajectories of compositional and isotope variations on the basis of large amount of hydrocarbon generation simulation experiments. The hydrocarbon source type, maturity, migration and accumulation process are considered in the model to study the evolution process of hydrocarbon. Moreover, the comparative study of shale gas in China and America is carried out basing on the model to analyze the dominant factor leading to the reversal of carbon isotope.*

[1] Clayton, C., 1991. Carbon isotope fractionation during natural gas generation from kerogen. Marine Petroleum Geol. 8, 232–240

[2] Tang Y, Perry J K, Jenden P D, et al. Mathematical modeling of stable carbon isotope ratios in natural gases †[J]. Geochimica Et Cosmochimica Acta, 2000, 64(15):2673-2687.

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