

Characteristic and Significance of Compound Specific Sulfur Isotope in Typical Saline Lacustrine Oils from Bohai Bay Basin

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Revolutionary New Method

A suite of 18 saline lacustrine oils from the Pucheng, Weicheng, Liutun and Wenliu oilfields in the north and 2 freshwater lacustrine oils from the Shanchunji oilfield in the south of the Dongpu Depression were selected for compound specific sulfur isotope characterisation by Gas chromatography with multicollector inductively coupled plasma mass spectrometry.

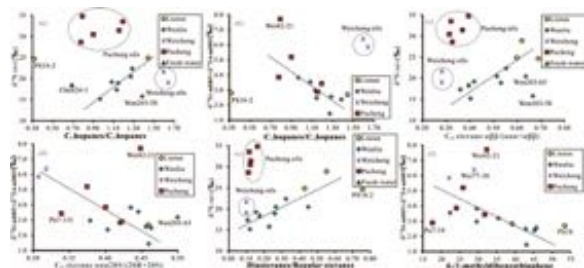


Figure 1: The relationship between depositional and thermal maturity biomarker parameters and compound specific sulfur isotope data.

Discussion of Results

Our results suggest the $\delta^{34}\text{S}$ value of the Dongpu oils are controlled by several factors including source, paleo-environment, thermal maturity and TSR. The relative significance of these controls on specific oil reservoirs may sometimes be distinguished from their respective $\delta^{34}\text{S}$ values. For instance, the $\delta^{34}\text{S}$ values of south fresh-water lacustrine oils are reflective of their depositional environment, the Wenliu oils were significantly impacted by thermal maturity and the distinctly $\delta^{34}\text{S}$ enriched OSCs of several deep oils by TSR. This study indicates that compound specific sulfur isotope could be used in oil-oil and oil-source rock correlation as well as thermal maturity evaluation and TSR identification.