

Chemometric de-convoluting marine mixed oils from the Tabei Uplift, Tarim Basin, China[†]

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Alternating least squares of biomarker concentrations (ALS-C) provides an excellent way to calculate the number, proportion, and compound compositions of the endmembers in mixed oil samples [1, 2]. Forty biomarker concentrations and whole-oil carbon isotope ratios were analyzed by ALS-C to de-convolute marine mixed oils from the Tabei Uplift.

Crude oils recovered from the Palaeozoic reservoirs are mixtures of oil having different maturity from diverse source rocks. Three endmember (EM) oils were identified by ALS-C.

EM1 is a minor contributor to the mixed oils. It was originated from Cambrian-Lower Ordovician source rocks in the early to peak oil window stage and experienced two phases of mixing and biodegradation.

EM2 is the secondary contributor with proportions ranging from 10% to 40% in most oil samples. It was originated from Middle-Upper Ordovician source rocks at the early oil generation stage and underwent two phases mixing of and one stage biodegradation in the reservoirs.

EM3 is the major contributor to most samples with proportions ranging from 13% to 95%. It was generated from Middle-Upper Ordovician source rocks at the late oil generation stage and combined with the previous residual mixtures in the reservoirs. The final mixtures were not biodegraded further and are currently produced from the Palaeozoic reservoirs in the Tabei Uplift.

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[1] Peters et al. (2008) *Organic Geochemistry* **39**, 623–645. [2] Zhan et al. (2016) *Organic Geochemistry* **92**, 1-15.