

PETROLEUM CLASSIFICATION BASED ON THE RATIO OF SULFUR TO NITROGEN: APPLICATION IN THE EAST TEXAS BASIN

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ABSTRACT

Petroleum families are characterized by limited ranges of organic sulfur to nitrogen (S/N) ratios, despite thermal cracking. In the East Texas Basin three families are recognizable on the basis of both carbon isotopic and S/N ratio data. Jurassic oils possess modal saturated hydrocarbon values of -25% $\delta^{13}\text{C}$ and S/N ratios close to 20; Lower Cretaceous oils, values of -26 and 10, and Upper Cretaceous oils, values of -28 and 3. Numerous published analyses of sulfur and nitrogen in oils facilitated mapping the detailed geographic distributions of the families recognized. Both source rock and petroleum data demonstrate that Upper Cretaceous oil, including that of the supergiant East Texas field, was generated only beyond the confines of the East Texas basin, principally to the south and west in the Gulf Coast basin. Migration distances to present pool sites are of the order of 30 to 200 miles.

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