

Geochemical Characterization of Core Extracts and Oils in the Hitch and Etzold Fields

Dongwon Kim¹, Paul Philp¹ (1) University of Oklahoma, Norman, OK

Crude oils and core extracts from the Hitch and Etzold fields in southwest Kansas have been analyzed by various geochemical techniques to evaluate the reservoir-filling history. A comparable study of source rocks in the adjacent basins was undertaken in an attempt to relate the oils to their possible source rocks. Analyses of oils and core extracts from the Hitch and Etzold fields indicate the primary source rock to be of Ordovician age based on the GC chromatograms and other biomarker distributions. Similarities of biomarker signatures and thermal maturity suggest that the Hitch and Etzold oils probably have a major common source. However, the Hitch oils and rock extracts are characterized by predominance of low molecular weight hydrocarbons and relatively high concentration of asphaltenes compared to the Etzold samples. The different geochemical components of the Hitch samples from the Etzold samples suggest a mixing of oils from different types of source rocks, a contribution from the Woodford Shale.

Stable carbon isotope values of saturate and aromatic fractions have been used to delineate the direction of oil migration from the source rocks. Migration induced compositional changes in oils and rock extracts, and the possible effects on the oil signatures by multiple sources have been examined and will be discussed. The results presented here indicate a successive oil migration from multiple source rocks to fill the reservoirs over an extended period time.