Geophysical Research Abstracts
Vol. 14, EGU2012-3301, 2012
EGU General Assembly 2012

A new stable carbon isotope record for the Cenomanian of the Arabian Plate

Y. Zhao, S.W. Lokier, and T. Steuber
The Petroleum Institute, Petroleum Geosciences, Abu Dhabi, United Arab Emirates (yzhao@pi.ac.ae)

The Natih Formation and its correlatable equivalents are important hydrocarbon reservoirs in the United Arab Emirates, Oman and Iran, yet the δ13C curve for the Cenomanian of the Arabian Peninsular is still poorly constrained. The development of a sequence stratigraphically constrained, high resolution δ 13C isotope curve for this reservoir interval will allow for a higher confidence when performing correlation of the sub-surface and will, thus, contribute to the development of more accurate reservoir models. This will, in turn, allow for enhanced and better-informed production strategies and will also serve as an aid for future exploration.

This study employs sedimentological and stable carbon isotopic analysis of the Natih Formation outcropping to produce the first high-resolution, stratigraphically-constrained carbon isotope curve for the Cenomanian of the Arabian Plate.

Following detailed sedimentary logging of the Natih sedimentary sequences in Wadi Mu'aydin, Sultanate of Oman, a sedimentary facies and micro-facies scheme was developed in order to construct a lithofacies and sequence stratigraphic architecture for the Natih Formation.
Following screening for diagenetic effects – typically those associated with meteoric diagenesis, samples were selected for stable isotope (δ13C) analysis with a sampling frequency rarely exceeding 1 m. A high resolution δ13C curve was constructed for the studied interval; this was correlated with previously published curves of equivalent age from the Middle East and Europe. Our results display prominent isotope excursions that can be confidently correlated both with low-resolution curves from the sub-surface of Oman and the high-resolution curves from the chalk of the United Kingdom. Where the new curve deviates from previously published δ13C records, we infer this to be a result of meteoric diagenetic processes resulting from subaerial exposure associated with relative sea-level lowstands.

The results of this study will allow for improved sub-surface correlations in age-equivalent formations throughout the Arabian Plate, and, therefore, will facilitate the development of improved models of hydrocarbon reservoir development and architecture.