

Trace Element Geochemistry: New Technology for Stratigraphic Correlations and Formation Evaluation: Abstract

Charles J. Lord¹

ABSTRACT

New technology based on the trace element chemistry of rocks is being developed as a tool for mapping subsurface formations in oilfields. This technology can be used to map rock formations in areas where traditional techniques are inconclusive. Trace element geochemistry complements and enhances conventional tools such as biostratigraphy, petrology, and log analysis. Applications cover a broad array of topics including stratigraphic correlations, interpretation of well log responses, age dating, and investigations of reservoir rock properties.

Current work is focusing on identifying trace element fingerprints that uniquely mark specific subsurface horizons. There is convincing evidence that trace element fingerprints retain their relative stratigraphic position even though the original mineralogy of the rock has been extensively altered. This means that many of the trace elements associated with specific subsurface rock strata remain in place and are simply transferred from the original mineral to a new (alteration product) mineral. The immobility of these elements is an important geochemical feature because virtually all of the rocks encountered in the petroleum industry are altered to some extent. The ability to "see through" alteration events and obtain information about the original rock is a key advantage of trace element geochemistry techniques.

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¹ Phillips Petroleum Company, Bartlesville, OK

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