

Inorganic Geochemistry of Shale Source Rocks

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EXTENDED ABSTRACT

Due to recent geologic findings and technological advances in the oil and gas industry there is great interest in producing hydrocarbons from shale source rocks. As a result, understanding the interactions among the inorganic chemistry, kerogen type, and the hydrocarbon generating potential of a shale source rocks has become important. The bulk of previous research on the characterization of source rocks was conducted mainly in the 1940s through the 1960s by investigators such as Frost, Phillipi, and others (summarized in Hunt, 1979). These authors described important linkages among clay content, inorganic constituents such as iron and sulfur, and the catagenesis of organic matter. Despite this early work, there are still large gaps in our understanding of inorganic and organic interactions in shale source rock as a function of depth, pressure, temperature, and time (e.g., Seewald, 2003). For example, transition metals may have a measurable impact on oil to gas cracking (Shuai et al., 2012).

In this study we evaluated the hypothesis that the inorganic chemistry of high-temperature and pressure leachates of shale source rocks reflects the degree of thermal maturity of the organic matter, as well as changes in the paleodepositional environment. The hypothesis was tested by comparing the results from high-temperature and pressure leaching experiments with pyrolysis analysis of the same shale source rocks.

... (Note: The full version of this extended abstract, including complete text, illustrations, and references, will be made available at a later date on both the 2014 GCAGS convention website [www.gcags2014.com] and AAPG Search and Discovery website [www.searchanddiscovery.com]).