

Geochemical Methods for Evaluating Liquid-Rich Shale Plays – Capabilities and Pitfalls

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Abstract

The results of organic geochemical analyses when integrated with other types of data (e.g. petrophysical, inorganic, structural, etc) are important in assessing liquid-rich source rock plays. Different types of geochemical data are used for the exploration and production stages of exploitation of these resources. In the exploration stage, the object is generally to evaluate the extent of the play and where the highest ratio of producible liquids to gas obtainable through fracturing will be found. During production, changes in GOR, and understanding changes in the flow rate of the well are commonly being assessed. The latter tends to concentrate on analysis of the produced hydrocarbons while there is more consideration of the kerogen component during the exploration stage. While these plays are called 'liquid-rich', it is generally natural-gas liquids and condensates that are the real target. This means that many of the standard geochemical methods use for conventional oil plays are generally not applicable over the elevated maturity range of tight oil plays.

While there is a wide diversity of methods available for organic geochemical assessment of liquid plays, there is at present no optimum/standard methodology. Many techniques are compromised by the sampling protocol used or by drilling and fracturing additives. Ideas will be presented as to what the future will bring regarding geochemical tools that can be used for assessment of liquid shale plays.