



Geochemical and petrological control on the reservoir quality of the unconventional petroleum systems in western Canada

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The commercial exploitation of the unconventional hydrocarbon resources in Canada has revolutionized the hydrocarbon supply picture. Canadian sedimentary basins hold great potential for unconventional gas and liquid hydrocarbon. There is a prolific production of the unconventional liquid and gas hydrocarbon from the lower Triassic and Jurassic formations in the Western Canadian Sedimentary Basin, while major Ordovician play in Eastern Canada has shown great potential for future exploitation. The main challenge in characterizing the unconventional reservoirs is that the traditional analytical approaches are poorly defined and calibrated for these resources. Characterizing the unconventional plays demand unconventional methodology, which takes into account various aspects of the combined source rock and reservoir system. This involves a complex understanding of the precursor organic matter in source rock, hydrocarbon generation and migration, thermal maturity, interaction between mineral matter and various organic matter phases in the rock, and the complex role of diagenesis in the reservoir quality and behaviour. This study relies on integrated inorganic and organic geochemistry, along with an innovative organic petrology approach to investigate micro variations in the compositions and the reservoir quality of the rocks throughout the cores obtained from the recent unconventional liquid and gas plays across Canada.