

Jurassic Condensate from Hudson Canyon, Baltimore Canyon Trough, U.S. Atlantic

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Molecular and isotopic properties of condensate samples from Kimmeridgian to Albian sandstone reservoirs of Hudson Canyon area provide evidence of vertical migration from Lower to Middle Jurassic carbonate and shale source rocks. Age of source rocks appears similar in U.S. and Canadian Atlantic. Visual kerogen assessment of the rocks shows mixed algal and higher-plant kerogen, explaining several diagnostic features of the condensate. The carbon isotopes of whole-condensate samples correlate to the Middle to Lower Jurassic rocks, reflecting mantle methane from rifting of Pangaea. Biomarkers are absent or present in low relative abundance indicating thermal maturation near the "deadline" for preservation of liquid hydrocarbons. The most powerful evidence of advanced maturation is concentration of the diamondoids, the most thermally stable complex hydrocarbons in the Earth's crust. The relatively high abundance of diamondoids indicates oil was almost totally cracked to form gas-condensate. Star diagrams (adamantane, diamantane, methyl and ethyl derivatives) imply a single source of condensate samples. Oceanographic research has established the presence of numerous sea-floor seeps of microbial methane. Deep traps may contain gas-condensate, shallow traps may contain microbial methane.