Pressure Volume Temperature (PVT) Analysis

RESERVOIR FLUID BEHAVIOR & PROPERTIES

PVT SERVICES

- Field sampling and wellsite services
- Sample transfer, validation and restoration
- PVT tests up to 20,000 psi and 400 degrees
- Reservoir fluid phase identification
- Surface separator fluid recombination
- Constant Composition Expansion (CCE)
- Differential Liberation (DL)
- Constant Volume Depletion (CVD)
- Multi-stage separator test
- Pressurized and Stock Tank fluid viscosities
- EOR – Minimum Miscibility (Slim Tube), Swelling and Multi- contact (reverse and forward)
- Flow Assurance - Asphaltenes and Waxes
- Long-term pressurized sample storage
- Working pressure maps
- PVT Cylinder Storage (Short and Long term)

GeoMark Research's established PVT laboratory has been serving the industry for over 15 years, providing critical subsurface fluid insights for our global customers:

- **Fluid Phase Prediction**: Predict when in-situ fluids will transition to multiple phases (bubble point and recoverable hydrocarbon insights)
- **Well Interactions**: Evaluate how parent-child relationships are affecting PVT behavior
- **Reservoir Continuity & Communication**: Pressure assessment to identify reservoir communication
- **Production Management**: Fluid property assessment for choke management and production infrastructure optimization

The GeoMark Advantage

Our specialists combine engineering and geochemical analyses to effectively expand our understanding of reservoir fluids. With the integration of PVT and Geochemistry, we can evaluate reservoir continuity between wells. Oils in compartmentalized reservoirs usually differ in molecular composition caused by biodegradation, multiple charge history etc., and can explain the differences in fluid properties. The variations in composition can be identified using high resolution whole crude Gas Chromatography (GC) which separates the many molecular components in petroleum. The resulting "fingerprints" from each zone are compared visually and with more complex multivariate statistical techniques to determine the similarities and differences between samples.

For more information, contact
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Mud Gas Isotopes

GEOCHEMICAL CHARACTERIZATION

GeoMark Research's established Mud Gas Isotope laboratory has been serving the industry for over 15 years, providing timely and trusted gas analysis data from exploration and production wells around the world. Our data provides insights to the following:

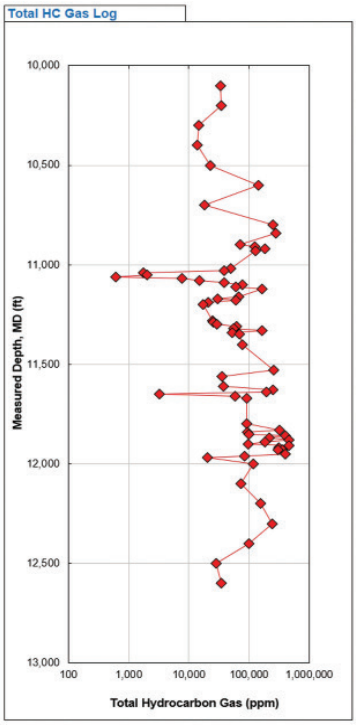
- **Gas Compositions:** Cost effective screening technique to quickly identify hydrocarbon bearing zones
- **Gas Classification (Biogenic vs. Thermogenic):** Helps determine the source of gas encountered within a well
- **Maturity and Mixing:** Evaluates delivery of gas source maturity and relative mixing between thermogenic and bacterial (insights to migration)
- **Wetness:** Identifies dry gas, condensate, or oil throughout the well
- **Connectivity:** Assesses if reservoirs are connected or sourced from the same source
- **Helium:** Exploration of alternative natural resources

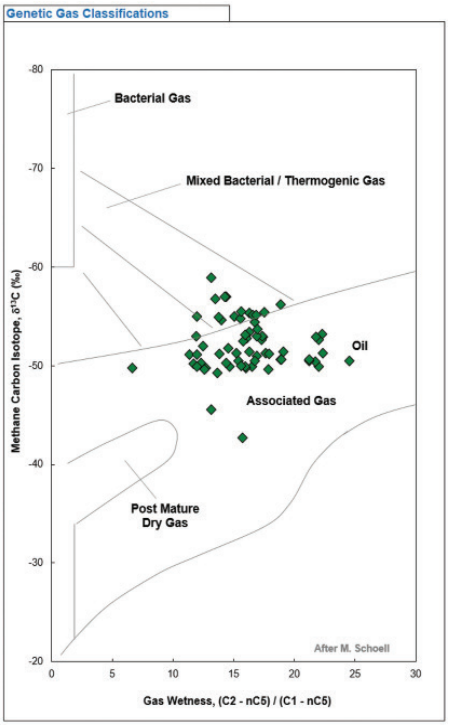
The figures below present a selection of data outputs and interpretations that can be made from Mud Gas Isotope Analysis. Stable gas isotopic data (methane, ethane, propane and higher molecules) have traditionally been used as geochemical source and maturity markers and to indicate the relative concentrations of biogenic and thermogenic components in reservoir fluids. Collected over multiple wells, this data can be used to evaluate continuity between different zones in single and multiple wells; connected reservoirs should have similar isotopic values.

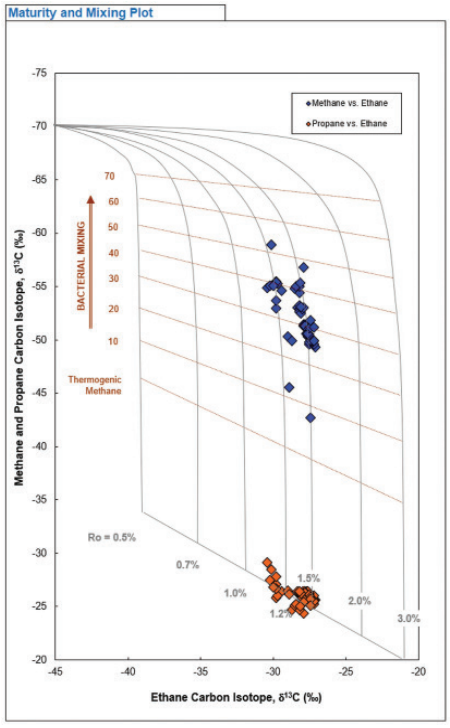
MUD GAS ANALYSES

- GC Compositions to C6+ including He, H2
- GC-IRMS Methane (C1) Carbon Isotope Compositions
- GC-IRMS Ethane (C2) Carbon Isotope Compositions
- GC-IRMS Propane (C3) Carbon Isotope Compositions
- Butane (normal & iso) Carbon Isotopes
- Pentane (normal & iso) Carbon Isotopes
- Deuterium Hydrogen Isotopes
- CO2 Isotopes

Deliverable Examples







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