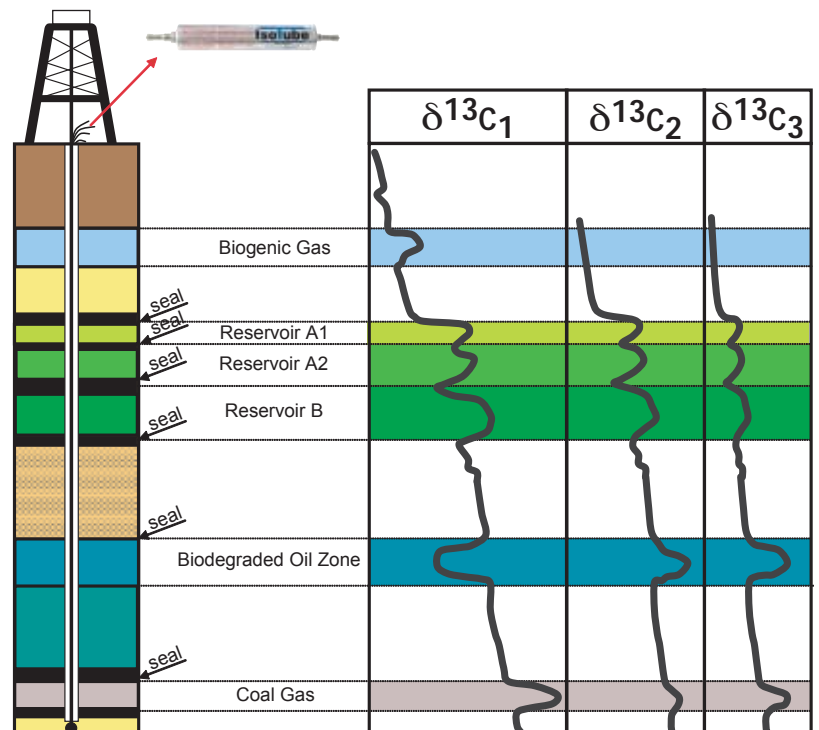


Isotopic Analysis of Mudgas

The gas that is brought to the surface with the drilling mud gives us a preview of the fluids in the rocks that are being penetrated. The traditional mud-logging operation provides only information on the concentrations of the light hydrocarbons. Although useful, gas concentrations can be greatly affected by secondary factors such as drilling rate, mud weight, formation plugging, etc. and are thus sometimes misleading. In recent years it has been recognized that carrying out isotopic analyses on gas samples collected at regular intervals during the drilling operation can greatly increase our understanding of the fluids encountered. For example, stable isotope concentrations in natural gases are the key to recognizing the origin of gases (biogenic or thermogenic) and their association with oils.

Applications of Mudgas Isotopic Analysis

- Characterization of petroleum system fluids
- Identification of reservoir compartments
- Prediction of oil and gas through maturation prediction and identification of source rocks
- Prediction of inert gas contents such as CO₂ using local calibrations
- Prediction of deep thermogenic petroleum systems in biogenic gas plays
- Reservoir seal identification and evaluation
- Correlation of fluids between wells
- Identification of biodegraded fluids
- Prediction of down-dip oil using local calibrations
- Safety: Prediction of shallow, over-pressured gas



Isotech capabilities in mudgas analysis

Working with most of the major oil companies, Isotech was the pioneering laboratory in the development of what has rapidly become a standard tool of the oil and gas industry. Isotech has fully automated analysis systems to allow processing large numbers of samples. Furthermore, it was Isotech that developed IsoTubes®, which are now used almost exclusively for the collection of mudgas samples throughout the world. Our state-of-the-art and highly calibrated analytical systems provide the “always reliable data” needed to maximize the usefulness of this new exploration tool. Isotech is the “standard” to which other laboratories are compared.



What's included in mudgas analysis?

- Detailed compositional analysis of C₁-C₅ hydrocarbons, fixed gases N₂, O₂+Ar, CO₂.
- Depending on concentrations, δ¹³C can be measured for C₁-C₅ components
- When concentrations are not sufficient for direct analysis of C₂-C₅ hydrocarbons, purge and trap enrichment techniques allow us to analyze these components at ppm levels.

Fast turnaround on samples

Analysis of C₁-C₃ on mudgas and headspace gases

Standard	5 business days
RUSH	1-2 business days

Advance arrangements required for RUSH orders.
Extended analyses, enrichments, and groups of > 200 samples may require more time.

Competitive prices

Compositional analysis

Standard	\$66 per sample
RUSH	\$132 per sample

Carbon isotope analysis (δ¹³C) of C₁-C₅ components

Standard	\$66 per component
RUSH	\$132 per component

Hydrogen isotope analysis (δ²H) of C₁-C₅ components

Standard	\$74 per component
RUSH	\$148 per component

δ¹³C analysis of low concentration C₂-C₅ using enrichment procedures

Standard	\$110 per component
RUSH	\$220 per component

MG-1 analysis package

Includes GC analysis and δ¹³C analysis of C₁

Standard	\$132
RUSH	\$264

MG-2 analysis package

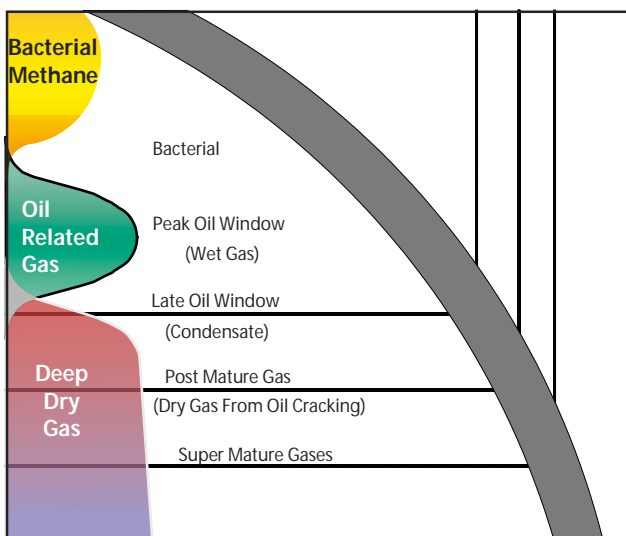
Includes MG-1 and δ¹³C analysis of C₂ and C₃

Standard	\$264
RUSH	\$528

*Advance arrangements required for RUSH SERVICE

δ¹³C of Methane (‰)

Maturity of Source Organic Matter



after Schoell (1995)

Increasing Temperature

