



Geochemistry: Tools for Effective Exploration and Development - MGT

COURSE

About the Course

Undiscovered reserves in prolific, mature basins and bypassed petroleum in developed fields are key targets for increasing reserves at minimal cost. Geochemical tools can dramatically improve discovery and development success by identifying and characterizing these targets in both conventional and unconventional systems. Course participants learn to interpret geochemical logs, map organic facies variations, identify petroleum systems using multivariate data, and predict vertical and lateral variations in oil quality and gas-to-oil ratios. The course teaches how to integrate geochemical, geological and engineering data to identify reservoir compartments, allocate commingled production, identify completion problems, and monitor flood progression. The class gives special attention to three key applications of oil fingerprinting to unconventional reservoirs:

1. Characterization of frac height
2. Quantification of the contribution of multiple formations to commingled production contacted by the induced fractures
3. Identification of 'cross talk' between wells completed in adjacent formations.

The course also explains how to optimize development by predicting vertical and lateral variations in API gravity and viscosity. Attendees learn interpretive guidelines to evaluate geochemical data. Interpretation pitfalls are illustrated using exercises. Sample collection techniques are discussed. No background in geochemistry is needed.

"Great class. Thanks! I feel like I learned a lot of new ways of utilizing the data I regularly work with." - Geologist, United States

"Everything shown was very useful. Really enjoyed the GC section and learning to interpret available GC data." - Geologist in Exploration

Target Audience

Exploration and development geologists, geophysicists, geochemists, petroleum engineers, managers, and technical personnel. No background in geochemistry is needed.

You Will Learn

Participants will learn how to:

- Characterize exploration risk in conventional and unconventional petroleum systems by assessing regional variations in organic facies, source maturity, source volumes, petroleum volumes generated, gas-to-oil ratios, and the risk of oil biodegradation
- Integrate geochemical, geological and engineering data to identify reservoir compartments, allocate commingled production, identify completion problems, and monitor flood progression to optimize field development
- Assess frac height in unconventional reservoirs, and identify 'cross talk' between frac networks in adjacent wells
- Quantify the abundance of frac water vs formation water in the produced fluids from recently drilled unconventional wells
- Use geochemical tools, including Total Organic Carbon (TOC), Rock-Eval pyrolysis, vitrinite reflectance, geochemical logs, gas chromatography, stable isotope ratios, biological markers (biomarkers), mud gas isotope data, and mud gas compositions
- Determine if hydrocarbon 'stray gases' found in an aquifer are, or are not, related to petroleum drilling activities in a given area
- Design geochemical studies and collect samples
- Recognize pitfalls in geochemical interpretations

Course Content

- Assessing source rock quality, maturity, and petroleum-generating potential
- Correlation: oil-to-oil, oil-to-source rock, gases-to-source rock
- Applications of mud gas isotope data and mud gas compositions
- Assessment of reservoir continuity, lateral and vertical changes in oil gravity and viscosity
- Geochemical assessment of frac height
- Geochemical allocation of commingled production
- Worldwide exploration and production case studies
- Determining the origin of hydrocarbon gases found in aquifers
- Project planning using actual case studies

Product Details

Categories: [Upstream](#)

Disciplines: [Geology](#)

Levels: [Foundation](#)

Product Type: [Course](#)

Formats Available: [In-Classroom](#) [Virtual](#)

Instructors: [PetroSkills Specialist](#) [Mark McCaffrey](#)

In-Classroom Format

7 Oct '2411 Oct '24- | Course | In-Classroom (in Houston)

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