



Congreso Mexicano del Petróleo

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## 6. PETROLEUM FLUIDS AND SOURCE ROCKS

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*“Compartir ideas para frontar nuevos retos”*

## Who Should Attend

**Geoscientists and geoscience managers who work on exploration, appraisal, development, production and environmental projects and require competency in petroleum fluids and source rocks.**

### Day 1

**Fundamentals of petroleum geochemistry. Sampling and analytical techniques.**

The first day introduces the participants to petroleum geochemistry. You will learn the composition of natural gases and oils and how to interpret gas and oil data. This will be followed by the discussion of sampling and analytical techniques for source rocks and petroleum fluids.

- Welcome and introductions
- Petroleum composition and phases
- Interpretation of hydrocarbon and non-hydrocarbon natural gases (molecular composition and isotopes)
- Interpretation of oils (from bulk parameters to biomarkers)
- Post-accumulation processes (biodegradation, thermal sulfate reduction, water-washing etc.)
- Sampling techniques (surface, drilling, production)
- Analytical techniques (Rock-Eval, gas chromatography (GC), mass-spectrometry (GC/MS))

#### **Exercises:**

- Match oil samples with whole oil GC traces.

### Day 2

**Petroleum exploration and drilling the prospect.**

The second day starts with the discussion of source rocks. Participants will interpret the quality and the potential of source rocks and will model petroleum expulsion. This will be followed by the discussion of exploration drilling and the data necessary to interpret the outcomes of exploration projects.

- Source rock presence, maturity and potential
- Expulsion from various organofacies
- Prediction of fluid properties in exploration projects
- 1D burial history and maturity
- Fluids and pressure
- Petroleum seeps
- Oil-source correlations

#### **Exercises:**

- Map and interpret source rocks.
- Build expulsion profiles for various source rocks.
- Constructing pressure profiles in subsurface.
- Correlate found oils to sources.

## Day 2

### **Appraisal, development, production, environmental and downstream projects.**

This day also focuses on the integration of petroleum geochemical data with other subsurface datasets to assist in appraisal, development and production of petroleum reservoirs. This will be followed by the discussion of petroleum spills and leaks. We will finish the course by studying how understanding of source rocks and petroleum fluids help create value in downstream projects.

- Reservoir compartmentalization
- Time-lapse geochemistry (surveillance)
- Production allocation
- Petroleum spills and leaks
- Oil value
- Gas value

#### **Exercises:**

Unravel compartmentalization of a reservoir.

- Determine sources of oils collected after a major offshore spill.



#### **Biography**

Dr. Alexei V. Milkov is Full Professor and Director of Potential Gas Agency at Colorado School of Mines and a consultant to oil and gas industry. After receiving PhD from Texas A&M University, Dr. Milkov worked for BP, Sasol and Murphy Oil as geoscientist and senior manager. He explored for conventional and unconventional oil and gas in >30 basins on six continents and participated in the discovery of >4 Billion BOE of petroleum resources. He also worked on several appraisal and production projects. Dr. Milkov has deep expertise in oil and gas geochemistry, petroleum systems modeling, exploration risk analysis, resource assessments and portfolio management. He published ~50 peer-reviewed articles. Dr. Milkov received several industry awards including J.C. "Cam" Sproule Memorial Award from the American Association of Petroleum Geologists (AAPG) for the best contribution to petroleum geology and Pieter Schenck Award from the European Association of Organic Geochemists (EAOG) for a major contribution to organic geochemistry.