MGS Luncheon

Thursday, March 24th

11:45am – 1:15pm (talk starts at 12:15pm)

Join us **in-person at the Northern in Billings** (Speaker will be remote on Zoom), or from the comfort of your home **via Zoom**

RSVP to montanageologicalsociety@gmail.com

If you want to join us at the Northern Hotel, RSVP by latest Friday March 18th!

If you prefer to join us on Zoom, RSVP by Wednesday March 23rd to receive the Zoom link

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SPEAKER: DR. DARIUSZ STRAPOC

SCHLUMBERGER, PARIS, FRANCE

Drill-bit Metamorphism: Impact Awareness, Monitoring Technology, Mitigation Attempts

Drill-bit metamorphism (DBM), the thermal degradation of drilling fluid at the drill-bit and rock interface because of drill-bit overheating and inefficient drilling, causes generation of nonreservoir gases, such as alkenes (ethene, propene, etc.), as well as compounds equivalent to petroleum reservoir species, such as alkanes (methane, ethane, etc.) and aromatics (benzene). This process is mainly associated with oil-based mud (OBM), enhanced use of drill bits containing diamonds and turbodrilling, deeper wells, and harder rocks. Intense DBM biases mud gas data interpretation while drilling and in extreme cases, it can generate so-called “ghost reservoirs,” for example in tight hydrocarbon-poor zones. Presence of alkene species at significant concentrations and with good correlation between them implies cracking of OBM and consequently, generation of nonreservoir alkanes as well. Preservation of reservoir information in mud gas may require an adjustment in drilling practice once the DBM is flagged. Presented methodology adapts gas chromatography-mass spectrometry procedure to calculate ethene concentration, thanks to detection of mass/charge ratio of 26 and 30. Additionally, a new compact gas chromatograph flame ionization detector analyzer for ethene and propene with short cycle time has been developed for efficient DBM flagging. In case the drilling practice cannot be adjusted and drilling continues with varying extent of DBM, an in-house methodology subtracts the impact of DBM on the reservoir-derived mud gas. The multi-alkene sensor is a key enabler of this DBM correction. Furthermore, the ability to log clear changes in the carbon-isotope composition of DBM-impacted methane (d13C-C1), ethane (d13C-C2), etc. can be alternatively used to improve the DBM correction of mud gas to represent the indigenous reservoir fluid.

Biography

Dariusz Strapoc received his M.Sc. in geology from Wrocław University, Poland (2002), and his Ph.D. in geochemistry, with a microbiology minor from Indiana University, Bloomington (2007). He then worked as a petroleum systems and biogas geochemist at ConocoPhillips in Houston for 3 years and briefly thereafter as an independent consultant (Dariusz BioGeoChem LLC). Since 2012, he has taken care of interpretation development as a senior geochemist at Schlumberger and has served as an associate editor for the Organic Geochemistry journal since 2015.