



James Collister, PhD

AFFILIATE SCIENTIST

James W. Collister holds a BA from the University of California at Santa Barbara in Biochemistry and Geology, and an M.S. and Ph.D. (both in Geology) from Indiana University. Following an 18 month postdoctoral research fellowship at the University of Bristol (England), he worked for E.S.R.I (Earth Sciences and Geosciences Institute), and the Energy & Geosciences Institute at the University of Utah (for nearly 8 years). His research experience covers a diverse range of sub-disciplines in the broad field of organic geochemistry including petroleum systems analysis (including the application of polytopic vector analysis to unravel subtle variations between mixtures of oils), isotopic biogeochemistry, and recent sediment geochemistry. He has also served as an associate editor of the journal Organic Geochemistry.

During his 15 years of experience in petroleum geochemistry he has worked on projects involving petroleum systems analysis in the Pricaspian Basin (Kazakhstan), Timan Pechora Basin (Russia), various basins in South America, the Caspian Sea region (Azerbaijan, Turkmenistan, and Dagestan), Yemen, the Williston Basin (North Dakota), and the Western United States (Nevada, Utah, and Wyoming). He has also worked on crude oil characterization projects using geochemical inversion in the Bohai Basin (China) and Indonesia. He has also been involved in studies using Polytopic Vector Analysis (PVA) to detect minor variations in oil composition due to reservoir compartmentalization. Presently, he is based in Los Angeles working as a Senior Chemist analyzing pesticides by GCMS for an environmental chemistry laboratory.

Biomarkers are chemical “fossils” in crude oils and source rock extracts that retain a recognizable structure that can be related to a biological organism. Hence, they carry information about the environment in which source rocks were deposited. Biomarkers can distinguish from lacustrine, marine, and terrigenous source rock facies, and can be used to correlate crude oils to source rock extracts. Crude oils derived from multiple source facies can also be determined if a sufficient number of samples are analyzed. Thus, it is possible to infer the type and number of source rocks from the crudes themselves. Biomarkers are also sensitive to maturity. Thus they can provide an estimate of the maturity level a sample has experienced. In the absence of measured vitrinite reflectance data in a frontier area, these maturity indicators can provide vital information for subsequent maturation modeling. Subtle differences in biological markers of crude oils can also be used to assess reservoir compartmentalization. Crudes from a single source rock found in a compartmentalized reservoir display subtle differences between the various compartments. Crude oil chemistry can, therefore be used to determine reservoir continuity.

Research Interests

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