

Dr. Alan S. Kornacki

Senior Petroleum Systems Analyst

Dr. Kornacki received his B. S. degree (1974) in geology from the University of Missouri at Rolla, and his Ph.D. (1984) in geology from Harvard University after serving on active duty for three years as a U.S. Army officer. Alan recently retired from Royal Dutch Shell, where for 26 years he specialized in developing, implementing, and integrating geochemistry and fluid property technology for a wide range of E&P applications. His initial assignment involved determining the geological processes that control the quality of crude oil generated by the Monterey Formation in the California coastal basins, and using Monterey oil and source rock samples to calibrate C₇ technology developed by Frank Mango. Alan was reassigned to Shell Offshore Inc. in New Orleans in 1990, where he worked for eight years as the geochemist in the deepwater E&P organization during the period when Shell opened up that important frontier petroleum basin. Alan identified the presence of a major petroleum system consisting of waxy, undersaturated sour oil mixed with dry microbial gas, and he collaborated with Shell research staff to develop novel reservoir geochemistry techniques to support costly deepwater business decisions. Alan was named the manager of the multi-disciplinary Rock and Fluid Services organization in Shell International E&P Inc. when he returned to Houston in 1998. His major accomplishments during the next five years were globalizing separate special core analysis and geochemistry analytical laboratories based in Houston and Rijswijk, managing the experimental CAPEX budget to significantly improve SCAL and geochemistry analytical capabilities, and leading the significant growth of both teams while supporting exploration and development projects in the global E&P portfolio. Following an assignment as the manager of a multi-disciplinary group that performed field studies for Shell's New Business Development organization, Alan was named the lead geochemist on the HC Charge and Asset Geochemistry Team in a technology Center of Expertise, and the Discipline Leader for the global geochemistry skill pool in Royal Dutch Shell. Alan developed new workflows to integrate and interpret data obtained on rock and fluid samples from unconventional HC resources, including the Colorado Oil Shale, Canadian tar sands, and numerous gas-shale plays in the USA, Canada, and China: e.g., Haynesville Formation; Bossier Formation; Eagle Ford Formation; Montney Formation; Doig Formation; Hilliard Formation; Baxter Formation. Alan also championed the integration of reactive transport modeling technology (TOUGHREACT) with dynamic reservoir modeling technology and core-flood experimental results to support CO₂ sequestration projects. He also played an active role recruiting, coaching, reassigning, and assessing Shell geochemists in his role as the geochemistry discipline leader. Dr. Kornacki has worked as a geochemistry consultant on a wide variety of conventional and unconventional E&P projects and environmental projects since retiring from Royal Dutch Shell. His detailed resume is shown below.

EDUCATION

Ph.D. *Harvard University*, Geology (in the area of cosmochemistry), 1984. Dissertation: The nature and origin of refractory inclusions in the Allende meteorite.

B.S. *University of Missouri at Rolla*, 1974. Geology.

INDUSTRY EXPERIENCE

Weatherford Laboratories, Houston, Texas:

Senior Petroleum Systems Analyst. Used geochemical data measured on oil, condensate, and gas samples to reevaluate PEMEX and BHP models of the number and type of source rocks that generated sweet oil, sour oil, and wet gas in the Gulf of Mexico Basin. Used geochemical data measured on oil, condensate, natural gas, and source rock samples to reevaluate BHP models of the number and type of source rocks that generated oil and gas in the Australia Northwest Shelf and the Orange Basin, South Africa. Organized and lead a joint industry research project to develop a method to measure the abundance and properties of producible oil present in shale core samples. Interpreted geochemical data measured on produced oil samples, seafloor sediments collected at oil and gas seeps, and oil slicks in the deepwater GOM to support the Macondo monitoring and remediation program implemented by BP. Interpreted geochemical data measured on natural gas samples produced from Pennsylvanian reservoirs and the Barnett Formation and collected from water wells to identify the source of thermogenic gas in the Trinity Aquifer at the Silverado Development in the Fort Worth Basin. Interpreted

geochemical data measured on natural gas samples collected from the Mississippi River Alluvial Aquifer (MRAA), the water column of a large sinkhole, and at gas seeps to identify the sources of thermogenic gas and microbial methane present in the MRAA near Bayou Corne after a salt solution cavern collapsed in Assumption Parish, Louisiana. Developed a three-day training course on using geochemical data measured on oil, condensate, natural gas, mud-gas, and source-rock samples to help identify, appraise, and develop unconventional oil and gas reservoirs. Taught shale geochemistry training course in the United States, Canada, China, the United Arab Emirates, Saudi Arabia, and Germany (2010-).

Shell International E&P Inc., Houston, Texas:

Principal Geochemist and Geochemistry Discipline Leader – Fluids and Basins Center of Expertise, EP Solutions. Integrated geochemical, geological, petrophysical, reservoir engineering, and production chemistry data to support a wide range of E&P projects involving the evaluation, appraisal, and development of unconventional oil and gas resources in North America and China. Applied novel technology to extract additional information about rock and fluid properties for tar sands, oil shale, and gas shale reservoirs.

Championed the application of reactive transport modeling technology to support CO₂ sequestration projects. Collaborated in preparing and implementing the strategic resourcing plan for the global geochemistry skill pool, and provided technical coaching and assurance for Houston-based geochemists supporting conventional and unconventional E&P projects. Helped organize several annual technical workshops for the geochemistry and basin modeling communities. Played an active role assessing the qualifications of campus recruits and experienced technical professionals in scientific and engineering disciplines who applied for positions with Royal Dutch Shell (2005-2010).

Shell International E&P Inc., Houston, Texas:

Manager, New Opportunities Group, EP Solutions. Managed the efforts of ~40 petroleum engineers, production geologists, and geophysicists in Houston, Texas and Rijswijk, The Netherlands who performed technical studies in support of New Business Development projects for Royal Dutch Shell. As a member of the leadership team of the EP Solutions organization, collaborated with other leadership team members to develop and implement the business plan for a multi-disciplinary organization that provided sub-surface technical services for the global Royal Dutch Shell organization. HSE focal point on the EP Solutions leadership team (2003-2005).

Shell International E&P Inc., Houston, Texas:

Manager, Rock and Fluid Services Group, Shell EP Technology and Research. Managed the efforts of ~50 geochemists, petroleum engineers, and laboratory technicians who provided specialized technical services for Royal Dutch Shell by developing and applying exploration geochemistry, reservoir geochemistry, and special core analysis technology. Supervised the efforts of four team leaders based in the USA and Holland. Successfully led the integration of Rijswijk- and Houston-based staff following the globalization of the Shell technology organization, and the significant expansion of their size and capabilities by approving the allocation of ~\$750,000 of experimental CAPEX and R&D funds per year. As a member of a leadership team, collaborated with other managers to develop and implement the business plan for a multi-disciplinary organization that provided sub-surface specialized technical services for the global Royal Dutch Shell organization. Organized a biannual Integrated Subsurface Conference for the Royal Dutch Shell organization. Led the successful implementation of a new HSE Management System for the Shell EP Technology and Research organization (1998-2003).

Deepwater Division, Shell Offshore Inc., New Orleans, Louisiana:

Staff Geochemist, Core Competencies Group. Provided geochemistry support for all exploration, appraisal, and development wells in the deepwater Gulf of Mexico. Interpreted geochemical data obtained at deepwater petroleum seeps to evaluate oil and gas charge prior to MMS lease sales. Collaborated with Shell research staff to develop and implement new reservoir geochemistry technology to help petroleum, facilities, and pipeline engineers design and operate costly floating and subsea production systems and export pipelines. Led a multi-disciplinary subsurface team that developed new concepts for evaluating structural and stratigraphic traps, petroleum seals, and the migration of hydrocarbons and brine in overpressured Gulf of Mexico turbidite systems. Supervised three geochemistry interns who successfully completed their projects (1990-1998).

Exploration Directorate, Shell Development Inc., Houston, Texas:

Senior Research Geochemist, Geology Research Department. Executed a multi-year R&D program to use well-characterized crude oil and source rock samples from the Monterey Formation to evaluate and calibrate C₇ technology developed by Frank Mango to understand the generation of petroleum. Independently developed new C₇ parameters to characterize oil and condensate samples whose composition has been altered by biodegradation, water washing, or the loss of volatile compounds. Applied C₇ technology to study the origin of natural gas and condensate in the North Sea while on a special development assignment at the Royal Dutch Shell E&P research organization in Holland (1986-1990).

Pacific Frontier Division, Shell Western E&P Inc., Houston, Texas:

Exploration Geochemist. Applied exploration geochemistry and basin modeling technology to study the generation of sour oil by the Monterey Formation in the onshore and offshore California coastal basins. Participated as a member of a special task force that clarified key reservoir rock properties of the Monterey Formation. Completed a field study of the Ojai oil field (which produces oil from Monterey reservoirs) (1984-1986).

ADDITIONAL CREDENTIALS

Military Service: US Army (active duty): Platoon leader in the 3rd Battalion/81st Field Artillery, 4th Missile Command, Republic of Korea (1975). Platoon leader and operations officer in Signal Company, 10th Special Forces Group (Airborne) (1976-1977). US Army Reserve: Executive officer and commander of SFODA 115, Company A, 1st Battalion/11th Special Forces Group (Airborne) (1977-1981). Operations officer for Company A, 1st Battalion/11th Special Forces Group (Airborne) (1981-1983). Special Forces staff officer assigned as an Individual Mobilization Augmentee to the US Pacific Command (1987-1993); the US Special Operations Command (1994-1995); and the Special Operations Directorate, J-33, Joint Staff (1996-1997). Retired from the US Army Reserve with the rank of lieutenant colonel (1997).

Military Education: Graduated from the Signal Officer Basic Course (1974), the Signal Officer Advanced Course (1980), the US Army Command and General Staff College (1990), and the US Army War College (1997).

Awards:

2015 Recipient of the Bernold M. “Bruno” Hanson DEG Excellence of Presentation (best paper) award, AAPG Division of Environmental Geosciences at the 2014 AAPG Annual Convention and Exhibition for the talk “Monitoring the active migration and biodegradation of natural gas in the Trinity Group aquifer at the Silverado Development in southern Parker County, Texas”. [AAPG Search & Discovery #80395](#).

2014 recipient (as coauthor) of the AAPG Energy Minerals Division President’s Certificate for Excellence in Oral Presentation 2013 AAPG Annual Convention and Exhibition for talk “Allocating the Contribution of Oil from the Eagle Ford Formation, the Buda Formation, and the Austin Chalk to Commingled Production from Horizontal Wells in South Texas Using Geochemical Fingerprinting Technology”. [AAPG Search & Discovery #41268](#).

2011 Recipient of the Frank Kottowski Memorial Award for best paper, AAPG Energy Minerals Division.

2008 Awarded Professional degree in geology and geophysics by Missouri University of Science and Technology.

Professional Contributions: *Member*, Scientific Advisory Committee, Center for Nanoscale Control of Geologic CO₂; Lawrence Berkeley National Laboratory, Berkeley, California (2010-).

Litigation Support: As a Consulting Expert in gas fingerprinting:

Consulting Expert (not Testifying Expert) in matter heard (January 19-20, 2011) before the Railroad Commission of Texas. Hearing to consider whether operation of the Range Production Company Butler Unit Well No. 1H (RRC No. 253732) and the Teal Unit, Well No. 1H (RRC No. 253729) in the Newark, E. (Barnett Shale) Field, Hood County, Texas are causing or contributing to contamination of certain domestic water wells in Parker County, Texas. Docket No. 7B-0268629.

PUBLICATIONS

- Kornacki, A. S. and McCaffrey, M. A. (2014), Monitoring the active migration and biodegradation of natural gas dissolved in the Trinity Group Aquifer at the Silverado Development in southern Parker County, Texas: Abstract, AAPG 2014 Annual Convention, Houston, Texas, April 6-9, 2014.
- Baskin, D. K., Kornacki, A. S., and McCaffrey M. A. (2013), Allocating the contribution of oil from the Eagle Ford Formation, the Buda Formation, and the Austin Chalk to commingled production from horizontal wells in South Texas using geochemical fingerprinting technology. Abstract, AAPG 2013 Annual Convention, Pittsburgh, Pennsylvania, May 19-22, 2013.
- Kornacki, A. S., Kreitler, C.W., McBeath, J. C., and McCaffrey, M. A. (2012), Integrated evaluation of alleged natural gas contamination of the Trinity Aquifer by horizontal gas wells completed in the Barnett Formation, southern Parker County, Texas: Abstract, AAPG 2012 Annual Convention, Long Beach, California, April 20-23, 2012.
- Kornacki, A. S. and McCaffrey, M. A. (2012), Composition, distribution, and origin of thermal, microbial, and biodegraded natural gas dissolved in the Trinity Group Aquifer, southern Parker County, Texas: Abstract, AAPG 2012 Annual Convention, Long Beach, California, April 20-23, 2012.
- Kornacki, A. S. and Carragher, P. D. (2011), The geochemistry and origin of crude oil and natural gas at naturally-occurring petroleum seeps in the Mississippi Canyon Protraction Area, deepwater Gulf of Mexico: Abstract, SETAC North America 32nd Annual Meeting, Boston, Massachusetts, November 13-17, 2011.
- Carragher, P. D. and Kornacki, A. S. (2011), The composition, origin, and transport of crude oil, thermal gas, and microbial gas in the deepwater Gulf of Mexico: From generation by source rocks and microbes to the formation of petroleum seeps and oil slicks: Abstract, SETAC North America 32nd Annual Meeting, Boston, Massachusetts, November 13-17, 2011.
- Novosel, I., Buker, C., Kornacki, A. S., and Dieckmann, V. (2011), Evaluating the gas shale potential of the Hilliard/Baxter Formation in the Green River Basin, Wyoming: Abstract, AAPG 2011 Annual Convention, Houston, Texas, April 10-13, 2011.
- Fuex, N., Kornacki, A. S., Dindoruk, B., El-Azhary, A., and Leischner, K. (2010), PVT and geo-chemical properties of wet gas in the Barnett Formation, Fort Worth Basin, Texas: Presented at AAPG/SPE/SPWLA Hedberg Conference on Critical Assessment of Shale Resource Plays, Austin, Texas, December 5-10, 2010.

- Zhang, G. and Kornacki, A. S. (2010), Geochemical reactive transport modeling of dryout processes during injection of supercritical CO₂ into deep saline formations: Abstract, AAPG Geosciences Technology Workshop on Carbon Capture and Sequestration, Denver, Colorado, August 10-12, 2010.
- Kornacki, A. S. (2010), Composition of produced gas and mud gas samples from Greater Sabine Bossier and Haynesville gas-shale reservoirs, Northern Louisiana, USA: Abstract, AAPG 2010 Annual Convention, New Orleans, Louisiana, April 11-14, 2010.
- Novosel, I., Manzano-Kareah, K., and Kornacki, A. S. (2010), Characterization of source rocks in the Greater Sabine Bossier and Haynesville Formations, Northern Louisiana, USA: Abstract, AAPG 2010 Annual Convention, New Orleans, Louisiana, April 11-14, 2010.
- Kornacki, A. S. and Nelson, K. C. (1998), Assessing the mix and the quality of crude oil and natural gas in the deepwater Gulf of Mexico: Abstract, AAPG Hedberg Conference on Integration of Geological Models for Understanding Risk in the Gulf of Mexico, Galveston, Texas, September 20-24, 1998.
- Titus, M. W., Kornacki, A. S., and Mahaffie, M. J. (1997), Fill'er up, Mac...and check the oil: Petroleum migration into pay sands at the Mars field: *Transactions GCAGS* **47**, pp. 647-648.
- Kornacki, A. S. (1996), Petroleum geology and geochemistry of Miocene source rocks and heavy petroleum samples from Huasna Basin, California. In *Hydrocarbon Migration and Its Near-Surface Expression* (Edited by D. Schumacher and M.A. Abrams), *AAPG Memoir* **66**, pp. 413-430.
- Kornacki, A. S. and Mango, F. D. (1996), C₇ chemistry of biodegraded Monterey oils from the southwestern margin of the Los Angeles Basin, California: Abstract, AAPG 1996 Annual Convention, San Diego, California, May 19-22, 1996.
- Kornacki, A. S. and McNeil, R. I. (1996), Chemistry and origin of Miocene and Eocene oils and tars in the onshore and offshore Santa Cruz Basins, California: Abstract, AAPG 1996 Annual Convention, San Diego, California, May 19-22, 1996.
- Kornacki, A. S., Allie, A. D., and Holman, W. E. (1996), Wet bacterial gas in the northern Gulf of Mexico Basin: Abstract, GCAGS 1996 Annual Convention, San Antonio, Texas, October 2-4, 1996.
- Kornacki, A. S., McNeil, R. I., Russell, S. J., Knigge, P. O., and Halpern, H. I. (1995), Oil quality and value in the deepwater Gulf of Mexico – Its influence on exploration, production, and transportation strategies: Abstract, AAPG 1995 Annual Convention, Houston, Texas, March 5-8, 1995.
- Kornacki, A. S., Kendrick, J. W., and Berry, J. L. (1994), Impact of oil and gas vents on petroleum exploration in the deepwater Gulf of Mexico. *Geo-Marine Letters*, **14**, 160-169.
- Shew, R. D., Tennant, S. H., Kornacki, A. S., and Rollins, D. R. (1994), Seal capacity measurements and description of mudrocks from the Gulf of Mexico: Abstract, AAPG 1994 Annual Convention, Denver, Colorado, June 12-15, 1994.
- Kornacki, A. S. (1993), C₇ chemistry of Monterey oils and source rocks from the Santa Maria Basin, California: Abstract, AAPG 1993 Annual Convention, New Orleans, Louisiana, April 25-28, 1993.
- Kornacki, A. S., Halpern, H. I., and Steffans, G. S. (1993), Petroleum source potential of Miocene and Eocene shales from the continental slope of the northwestern Gulf of Mexico: Abstract, GCAGS 1993 Annual Convention, Shreveport, Louisiana, October 20-22, 1993.
- Kornacki, A. S. (1989), Geological and geochemical evaluation of the origin of heavy oil in the Salinas Basin, California: Abstract, AAPG 1989 Annual Convention.

Kornacki, A. S. and Fegley, B. (1986), The abundance and relative volatility of refractory trace elements in Allende Ca,Al-rich inclusions: Implications for chemical and physical processes in the solar nebula. *Earth and Planetary Science Letters*, **79**, 217-234.

Kornacki, A. S. and Wood, J. A. (1985), Mineral chemistry and origin of spinel-rich inclusions in the Allende CV3 chondrite. *Geochemica et Cosmochemica Acta*, **49**, 1219-1237.

Kornacki, A. S. and Wood, J. A. (1985), The identification of Group II inclusions in carbonaceous chondrites by electron probe microanalysis of perovskite. *Earth and Planetary Science Letters*, **72**, 74-86.

Kornacki, A. S. and Wood, J. A. (1984), The mineral chemistry and origin of inclusion matrix and meteorite matrix in the Allende CV3 chondrite. *Geochemica et Cosmochemica Acta*, **48**, 1663-1676.

Fegley, B. and Kornacki, A. S. (1984), The geochemical behavior of refractory noble metals and lithophile trace elements in refractory trace elements in carbonaceous chondrites. *Earth and Planetary Science Letters*, **68**, 181-197.

Kornacki, A. S. and Wood, J. A. (1984), Petrography and classification of Ca,Al-rich and olivine-rich inclusions in the Allende CV3 chondrite. *Proceedings 14th Lunar and Planetary Science Conference*, in *Journal of Geophysical Research*, **89**, B573-B587.

Fegley, B. and Kornacki, A. S. (1984), Origin of spinel-rich chondrules and inclusions in carbonaceous and ordinary chondrites. *Proceedings 14th Lunar and Planetary Science Conference*, in *Journal of Geophysical Research*, **89**, B588-B596.

Cohen, R. E., Kornacki, A. S., and Wood, J. A. (1983), Mineralogy and petrology of chondrules and inclusions in the Mokoia CV3 chondrite. *Geochemica et Cosmochemica Acta*, **47**, 1739-1757.

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

American Association of Petroleum Geologists
Geological Society of America