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Research Interests

- Tracer Development
- High-Temperature Borehole Tools
- Fluid Diverters
- Engineered Geothermal Systems
- Shale-Gas Production
- Laboratory Flow-Reactor Design and Fabrication

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Peter Rose, PhD

Research Professor

Dr. Rose received an M.Sc. in Chemistry from the University of Utah in 1974 and a Ph.D. in Chemical Engineering from the same university in 1993. In the interim, he worked as a rocket scientist at Thiokol Corporation on the development of composite casings for solid-rocket motors. For the past 22 years, he has been employed at EGI where he serves as a Research Professor in the Department of Civil and Environmental Engineering, an Adjunct Professor in the Department of Chemical Engineering and the Geothermal Program Coordinator. He holds four patents and has published more than 50 papers in professional journals and conference proceedings.

Tracer Development

Dr. Rose's research focuses primarily on the development of liquid-phase and vapor-phase tracers for use in hydrothermal and petroleum systems. These tracers are robust, detectable and nontoxic compounds that are designed for the rigors of temperature, pressure, and chemistry of challenging environments to reveal near-wellbore and interwell flow patterns. By characterizing and adjusting such properties as reversible adsorptivity and thermal decay using laboratory batch and flow reactors, these tracers can, in addition, provide information on reservoir properties such as pore volume, residence time, and fracture surface area—all important parameters in the design and maintenance of reservoir productivity. A family of tracers that Dr. Rose's group developed—the naphthalene sulfonates—have gained widespread application in geothermal and petroleum fields around the world. Other families of tracers in whose development his group has been instrumental include the fluorinated benzoates, the short-chain aliphatic alcohols, the perfluorocyclic hydrocarbons and reversibly adsorptive compounds.

A Borehole Fluorimeter

Another research interest for Dr. Rose is the development of a novel borehole fluorimeter for determining flow rates downhole in geothermal and in waterflood-injection applications. The tool is based on the tracer dilution method. Work is in the second year of a Phase 2 STTR award from the Department of Energy (DOE) to design and demonstrate a field prototype that, if successful, will be commercialized under the Phase 2 program.

Fluid Diversion Agents

Dr. Rose is also pursuing the design and demonstration of novel fluid diversion agents that are designed to temporarily block newly-created hydraulic fractures while other stages are being hydrofractured within the formation. After an appropriate duration, the diverters decay according to known kinetics and the fracture permeability is restored. This process avoids the expense and difficulty of setting packers for flow isolation. Dr. Rose and his group has already successfully demonstrated the process in geothermal reservoirs.