Geophysical Research Abstracts,
Vol. 11, EGU2009-11799, 2009
EGU General Assembly 2009

Unconventional Shale-Gas Resource Systems and Processes Affecting Gas Generation, Retention, Storage, and Flow Rates

D. M. Jarvie (1), R. P. Philp (1), and B. M. Jarvie (2)
(1) University of Oklahoma, (2) Geomark Research

Geochemical and petrophysical characterization of various shale-gas systems in the U.S. indicates a variety of unconventional shale-gas system types. The most basic distinction is gas type: biogenic and thermogenic, although there can also be mixtures of the two gas types. Thermogenic shale-gas systems are further segregated into various sub-types depending on geochemistry and geology. The shale-gas system categories are: (1) high thermal maturity shale; (2) low thermal maturity shales; (3) mixed lithology intra-formational systems containing shale, sands, and silts; (4) inter-formational systems where gas is generated in a mature shale and stored in a less mature shale, and (5) mixed systems. A key difference among these shale-gas systems are initial gas flow rates. High thermal maturity systems tend to have much higher gas flow rates than low maturity systems because of gas charge and storage mechanisms. Certainly other non-geochemical factors, such as shale mineralogy, are extremely important in being able to stimulate these shales to flow gas.

Geochemical comparison of the Antrim Shale (Michigan Basin), New Albany Shale (Illinois Basin), and Barnett Shale (Fort Worth Basin) are used to illustrate these different systems as well as other systems.

These systems show significant differences in gas type, organic richness, thermal maturity, and gas flow rates. Gas flow rates are then dependent upon the amount of gas stored (or generated) and the ability to release gas from adsorption sites as well as connecting to micro-reservoir compartments.