

Project Title: Biogenic coalbed methane production: Determination of chemical compound classes supporting microbial methanogenesis
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Stimulation of biogenic coalbed methane (CBM) can be considered a more environmentally benign method of harvesting energy from coal. Little is known about anaerobic metabolism of the complex forms of carbon in coal.

Based on extractability using various solvents, we operationally defined 3 classes of organic compounds in 2 coals and studied microbial CH₄ generation in anoxic bioreactors using these compound classes as sole sources of carbon. We also analyzed the composition of the extracts prior to and following methanogenesis to determine the chemical changes in the biodegraded residues.

Methane production was observed in almost all bioreactors and apparent simultaneous degradation of both *n*-alkanes and aromatics occurred with substantial degradation of low molecular weight polycyclic aromatic hydrocarbons (PAHs).

Anaerobic biodegradation of PAHs in coal extracts

