Coal Characterization for Coal Bed Methane Production

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Abstract
Within the past decade methane production from coal seams has progressed from the demonstration phase to the exploration phase and currently to the economic production phase. Research specific to Canada's CBM reserves will be essential for the development of CBM as an industry in Canada.

This research encompasses a laboratory evaluation of parameters important to CBM production from Alberta coals, enhanced coal bed methane (ECBM) production, and greenhouse gas disposal. Coal permeability and gas storage capacity for different gases are two of the most crucial parameters in CBM and ECBM development. For this reason, much of the focus when assessing CBM reservoirs in Canada is on understanding cleats and natural fractures, both in outcrop and in core taken from well bores.

Different gases adsorb on coal to different degrees. Swelling and shrinkage caused by adsorption and desorption of different gases or by displacement of one gas by another, are expected to affect coal permeability. Core flood experiments in coal to measure the permeability of helium under equilibrium conditions are conducted. Data on equilibrium adsorption properties (adsorption isotherms) are independently obtained for comparison with flow experiments.

Coal characterization studies using imaging devices are also presented. X-ray computerized tomography (CT) and micro CT are used on coal samples, to provide a better understanding of fracture morphology and apertures. Visualization at both resolutions allows for discussion and comparison of structural characteristics at both scales.