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EASTERN ILLINOIS UNIVERSITY
Charleston, Illinois

news

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L/A/M

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FOR IMMEDIATE RELEASE

CHARLESTON, IL--Producing liquid fuel from coal (liquefaction) isn't a new technology. Germany did it during World War II and it's being done today in South Africa.

There's a drawback, though. Cost of the method using current technology is the approximate equivalent of a \$55 barrel of crude oil. That's where Dr. David Buchanan comes in. Since 1982 the Eastern Illinois University professor has been studying the chemical makeup of coal with the aim of helping chemical engineers improve the efficiency of liquefaction.

"When you liquefy coal," Buchanan says, "you can make all the things you can make from petroleum. And there is more hydrocarbon fuel in coal in the United States than in the energy value of oil reserves all over the world."

The key to improving current technology, as Buchanan sees it, is understanding the chemical composition of coal. Basic thrust of the research project is to develop methods and study changes brought about in the organic material of Illinois coal by mild oxidation (artificial weathering).

The study will show how air (oxygen) changes coal, how fast the changes occur, and how the changes vary from coal to coal, even from the same mine. Knowledge of these changes permits the pulling out of fractions, or components, for more detailed study. These separations are based on chemical differences.

"To come up with a new technology," Buchanan says, "you need to thoroughly know what you're starting with."

A significant sidebar to the study involves sulfur content of Illinois coal. Sulfur is now generally removed with scrubbers after the combustion process. The newer aim is to remove sulfur before the coal is burned, and information gained in the composition research may lead to that technology.

"That process," according to Buchanan, "will make Illinois coal more economically competitive with other coal mined in the U.S."

Supplying the major funding for the research at Eastern has been the Illinois Coal Development Board. Now being used is a \$78,180 grant for the year ending Aug. 31, 1987. Since the project started, the Board has provided \$215,000. Another sponsor is the Electric Power Research Institute.

Don Etchison, Director of the Illinois Department of Energy and Natural Resources, parent agency of the Coal Development Board, said "this project has provided additional insight into the nature of Illinois coal. Dr. Buchanan's promising research is necessary to help make Illinois coal more well understood in the academic community and in the industrial sector."

Working this year with Buchanan as co-investigator is Dr. Raymond Pheifer, a Geology Department faculty member at Eastern. Linda Warfel, technician, and students are also involved. Parenthetically, Buchanan believes directing students in research is a good teaching tool. And about Pheifer: "his addition to Eastern's staff presents a unique opportunity for interdisciplinary research on Illinois coal. For six years Pheifer was a senior geologist responsible for organic coal petrography (the science of describing and classifying rocks) at the Bellaire Research Laboratory of Texaco, Inc.

Coal, one might say, is a hot topic at Eastern. Vince Gutowski, Geography Department, does acid rain monitoring. An \$8 million coal conversion facility has been completed at the University and is geared toward burning Illinois coal as the main power source.

Coal needed by the Eastern researchers comes from the Argonne National Laboratory or is supplied by the Illinois State Geological Survey. Prior to study procedures, the coal has never been exposed to air. New sections of seams in the mines are opened and coal from these sections are sent to Eastern in air-tight packaging.

Buchanan and Pheifer work with about one ounce of coal at a time. It is ground into powder of the approximate consistency of talcum. Organic materials are then dissolved by solvent extraction processes, and this tells the researchers what components are originally in coal.

This information, then, is what will lead to reaching the research goal of assisting chemical engineers with more efficient liquefaction and pre-combustion elimination of sulfur in Illinois coal.

Buchanan is quick to point out that liquid fuel from coal will not be cheaper than petroleum-based fuel, but he believes competition from liquid coal made possible by new technology will place a cap on oil prices. Also, high tech methods of liquifying coal will spur the mining industry in Illinois. And, just as significantly, desulfurization will likely spur more mining in the short run (20 years) than liquefaction.