**Global Challenges/Chemistry Solutions  
Confronting Climate Change: The Quest for Permanent Solutions: A milestone for new carbon-dioxide capture/clean coal technology**

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An innovative new process that releases the energy in coal without burning — while capturing carbon dioxide, the major greenhouse gas — has passed a milestone on the route to possible commercial use, scientists are reporting. Their study in the ACS journal Energy & Fuels describes results of a successful 200-hour test on a sub-pilot scale version of the technology using two inexpensive but highly polluting forms of coal.

The researchers explain that carbon capture and sequestration ranks high among the approaches for reducing coal-related emissions of the carbon dioxide linked to global warming. This approach involves separating and collecting carbon dioxide before it leaves smokestacks.

Here is L. S. Fan, Ph.D., who is with The Ohio State University, and is lead author:

*“Our team has been working for more than a decade on two versions of carbon captures called Syngas Chemical Looping and Coal-Direct Chemical Looping. They involve oxidizing coal, syngas or natural gas in a sealed chamber in the absence of the atmospheric oxygen involved in the conventional combustion.”*

He explains further how this carbon capture method works.*“Metal compounds containing oxygen are circulating between two chambers. In the first chamber,they provide oxygen for the oxidation, take up the coal’s energy and store it in the metal. In the second chamber, metal compounds release the energy as heat and are regenerated for another run, completing one cycling loop.”*

Their report describes the longest continuous operation of the CDCL test system.

*“It operated successfully for 200 hours without an involuntary shutdown. The system used sub-bituminous and lignite coals, which are the main source of carbon dioxide emissions at United States coal-fired power plants. Carbon dioxide captured during operation had a purity of 99.5 percent.”*

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Today’s podcast was written by Michael Bernstein. I’m Katie Cottingham at the American Chemical Society in Washington.