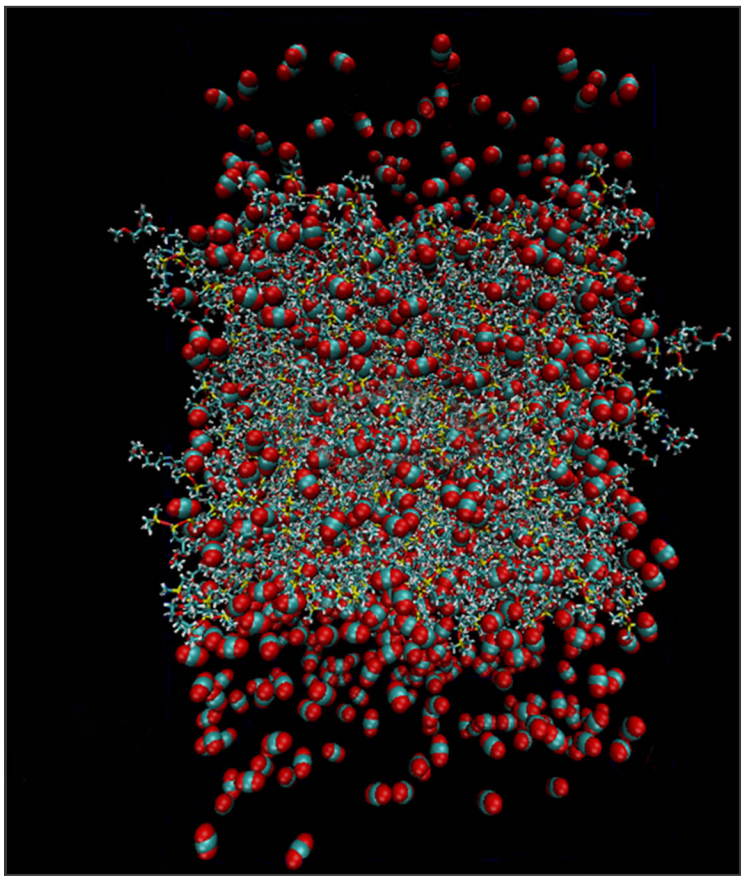
SUCCESS STORY

NETL LICENSES TRANSFORMATIONAL TECHNOLOGY FOR CARBON DIOXIDE CAPTURE



Carbon capture and storage from fossil fuel-based power generation systems are critical strategic components to curb emissions of atmospheric carbon dioxide (CO_2). Currently available carbon capture processes are limited—significantly reducing the efficiency of power generation and increasing electricity cost.

Working in collaboration with partners at Carnegie Mellon University, NETL researchers have developed a number of novel ionic liquids and polymers that provide a more efficient and economical process for CO_2 capture. The suite of technologies, covering the syntheses and use of ionic liquids, has been exclusively licensed to Liquid Ion Solutions, a Pittsburgh-based chemicals manufacturing start-up.

In addition to CO_2 capture, ionic liquids have potential applications in areas including separation of chemical species from mixtures, batteries and fuel cells, solvents, coatings, lubricants, and biological systems. The company plans to begin small-scale manufacturing of the materials for sale into a variety of research markets. The company will also focus on collaborative research to further expand product applications in emerging industrial markets.

Ionic liquids are organic salts that are commonly liquid at room temperature. These materials have been shown to be good candidates for CO_2 capture due to inherent desirable properties such as high thermal stability, high CO_2 solubility, and low environmental impact. The use of ionic liquids for CO_2 capture has been limited by their synthetic complexity and high viscosity. The new process simplifies the production of ionic liquids while reducing viscosity problems. The resulting compounds have increased CO_2 solubility and thermal stability that facilitates high efficiency, reversible CO_2 capture in high temperature environments.

These materials and methods have the ability to improve the efficiency and economics of carbon capture processes in gasification-based or flue gas systems. Large-scale implementation of the technology could lead to significant progress in meeting national climate and energy goals, including decreased greenhouse gas emissions, promoting domestic manufacturing and technology job creation, facilitating industrial competitiveness, and providing the nation with cleaner and more affordable electric power.

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