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Intellectual Property

Status:

Patent Pending

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Method for the Electrochemical or Chemical Capture and Release of Carbon Dioxide

AzTE Case # M11-129P

Background

Power plants, automobiles, and many other sources expel billions of tons of greenhouse gases into the atmosphere each year. A major greenhouse gas is carbon dioxide. As the world's population increases, the amount of fossil fuel used to create energy increases, as the amount of fuel burned increases, the amount of carbon dioxide in the atmosphere increases. A process to efficiently capture and later release carbon dioxide would have a large positive impact on the environment and have immediate application.

Invention Description

Researchers at Arizona State University have created a novel method for capturing carbon dioxide, temporarily storing it, and easily releasing in a safe environment. The process utilizes disulfide precursors in a process that requires less energy and is much safer allowing the captured carbon to be released in environmentally safe ways. By using disulfide precursors to capture carbon dioxide, thiocarbonates are formed and can later be oxidized to release the carbon dioxide and recover the precursor.

Potential Applications

- Coal burning power and natural gas plants
- Crude Oil Extraction
- Urea Production
- Plant Growth

Benefits and Advantages

- **Safer** – The thiocarbonate is very stable.
- **More Efficient** – The method could reduce energy and cost requirements by more than half.
- **Portability** – The ability to trap the carbon dioxide in the stable thiocarbonate allows for the carbon dioxide to be transported, and released in a desired location.