



## ELECTROCHEMICAL CAPTURE AND RELEASE OF CO<sub>2</sub> USING INORGANIC SORBENT MATERIALS

[View U.S. Patent Application Publication No. WO2025/136759 in PDF format.](#)

**WARF: P240062W001**

Inventors: Marcel Schreier, Guangjing Li

### The Invention

UW-Madison researchers have developed an electrochemical method and associated system for the adsorption/desorption of CO<sub>2</sub>. The system includes a porous inorganic oxide electrode (e.g., TiO<sub>2</sub>) and a non-aqueous solution comprising a dissolved electrolyte (e.g., tetrabutylammonium hexafluorophosphate (TBAPF<sub>6</sub>)). In operation, a gaseous input comprising CO<sub>2</sub> is introduced whereupon it saturates the electrolyte. A negative voltage is applied to the electrode to generate nucleophilic sites on the TiO<sub>2</sub> surface which subsequently adsorbs the CO<sub>2</sub> from the electrolyte solution. Once saturated, desorption of the CO<sub>2</sub> from the organic oxide electrode was achieved by applied a positive voltage. In their bench scale system, a voltage sweep of -1.7 V to 0.6 V was sufficient to adsorb and desorb the CO<sub>2</sub>.

#### Tech Fields

- [Clean Technology : Monitoring, remediation & waste reduction](#)

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