



CycCap: Cyclic Capture of Atmospheric CO₂



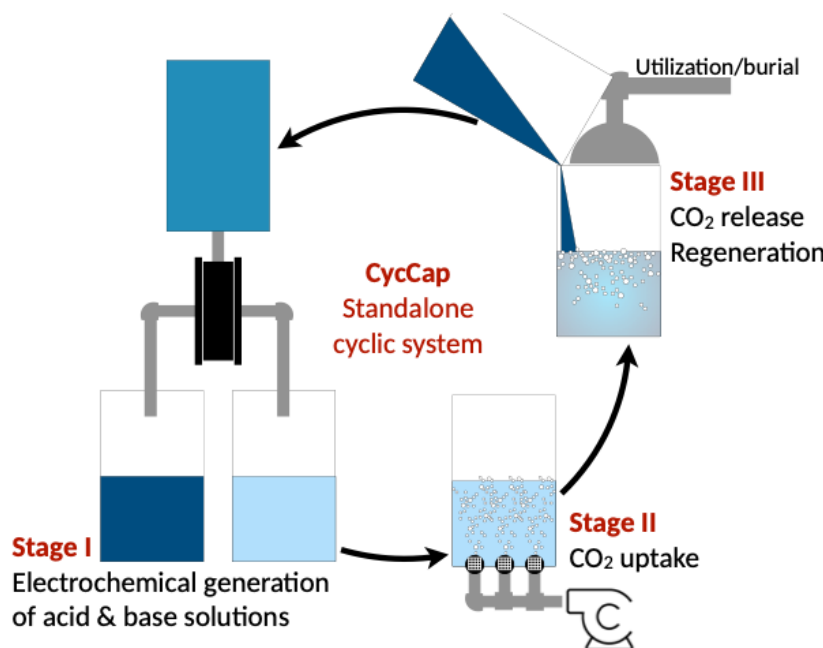
Material
Science



Climate
Tech

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Reducing greenhouse gas emissions alone will not be enough to limit the impacts of climate change – active removal of CO₂ from the atmosphere is essential. CycCap addresses this need with a cyclic process in which a salt solution is electrochemically split into alkaline and acidic streams. The alkaline solution captures atmospheric CO₂ through aeration, while recombination with the acidic stream triggers rapid, energy-free release of pure CO₂ and simultaneous regeneration of the original salt solution. This closed-loop system operates without consumable reagents or waste generation and can be implemented at scale using mature industrial electrodialysis and aeration technologies



APPLICATIONS

- Large-scale removal of atmospheric CO₂ for climate stabilization
- Integration with CO₂ utilization processes
- Deployment at industrial sites to capture both flue gas emissions and atmospheric CO₂, maximizing removal capacity and leveraging shared infrastructure

DEVELOPMENT STAGE

- Laboratory proof-of-concept completed, demonstrating efficient, repeatable CO₂ capture and release using commercially available electrodialysis and pumping equipment.
- Optimization of batch parameters is underway, with a flow-through lab-scale system in development.

DIFFERENTIATION



No ongoing chemical inputs: no additional alkalinity or consumables needed



No waste generation: only pure CO₂ is produced for utilization or burial



Energy-free CO₂ release: rapid, spontaneous release without heat or pressure



Scalable & low-cost: uses established industrial equipment to achieve capture costs below ~\$100/ton

