



## Inventors

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# Strengthening the Drying and Sorbing Cycles of Humidity Swing Sorbents

AzTE Case #M16-056P

## Background

Unlike typical sorbents, certain moisture/humidity swing sorbents have an increased affinity for carbon dioxide as they dry out in open air, making them an excellent candidate for carbon capture and harmful emissions reduction. However, establishing the conditions for moisture swing becomes challenging as the carbon dioxide concentration in open air is low and humidity varies throughout the day. Therefore, scientists are now looking to develop methods with improved drying and sorbing cycles in order to produce a structure capable of capturing carbon dioxide in larger amounts and in a more reliable manner.

## Invention Description

Researchers at ASU have developed a method to improve humidity swing sorbent cycles by using low grade heat to lower the humidity of air flowing through a detector. Low grade heat like solar heat warm the air flowing through a detector and reduce the humidity, subsequently raising the performance of the sorbent. Likewise, removing water vapor from the incoming air then subjecting the sorbent to drying produce the same effect. Drying occurs by subjecting the sorbent to solar heat and/or the change in humidity throughout the day, increasing capacity and the affinity of the sorbent for carbon dioxide. In summary, the improved cycles result in a sorbent with a unique property that has an improved carbon dioxide capacity and can operate on low cost heat.

## Potential Applications

- Carbon Capture and Storage
- Commercial and Industrial Carbon Dioxide Processes
- Heterogeneous Catalysis
- Sorbent Regeneration

## Benefits and Advantages

- **Improved Capacity** – The drying cycle results in a humidity swing sorbent with larger capacity for carbon dioxide
- **Low Cost** – The method can operate on low cost, low grade solar heat or other types of reusable heat sources
- **Unique** – The sorbents have the trait of an improved performance when the air moves through the collector stage which is opposite of typical sorbents

## Intellectual Property

**Status:**

*Pending*

## Contact

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