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Practical Method of CO2 Sequestration

Researchers at the University of South Florida have discovered a method to solve the cyclic capacity reduction problems encountered during the carbon dioxide sequestration process in cyclic operation, mainly caused by pore plugging and sintering of the CO2 absorbing matrix.

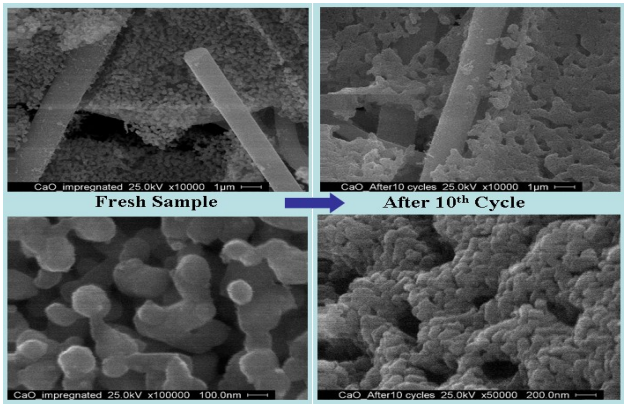
Compounds such as calcium oxide or calcium hydroxide are utilized for CO2 sequestration process to form calcium carbonate. When these compounds are saturated due to the absorption process, they can be regenerated by removing CO2 under the right conditions. However, the existing CO2 sequestration technologies focus on sequestration rather than the prolonged lifecycle of the absorbent during the cyclic operations of the sequestration process. Additionally, the costs associated with the current CO2 sequestration technologies range between $100 to $300/ton of CO2 produced, which are very high.

In this invention, in order to minimize these shortcomings, a simple and effective technique of immobilizing the calcium oxide absorbent as a film on substrates such as fibrous ceramics was developed. The prepared samples indicated a marked improvement in the cyclic life and durability of the absorbent in repeated CO2 absorption-regeneration cycles. The process and the device of this invention can capture CO2 at the source, such as a coal power plant, so that CO2 from the power plant may be sequestered. The process and the device of this invention can also be used in hydrogen production from biomass while increasing the hydrogen yield by 125% and reducing the tars.

ADVANTAGES:

- **Immobilization of calcium oxide to maintain CO2 absorption capacity**
- **Regeneration of original compound for re-use in sequestration process and other applications**
- **The repetition of sequestration cyclic operations using the original absorbent**

Breakthrough in CO2 Cyclic Absorption/ Desorption Capacity for Sequestration



Calcium Oxide Absorbent on Ceramic Fibers in Cyclic Operation

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