Carbon Materials Catalyzed Anime Sorbent-Based CO2 Capture

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Patent Status:
Patent Pending

Description of Technology

In order to reduce CO2 emissions, capture and storage has been considered as one of the most promising technologies because it not only reduces the emissions, but can create a secondary revenue stream with the CO2 as a product. Among the various CO2 capture technologies, the amine scrubbing process is very effective but also very expensive. It works by first burning coal in the normal way, but then bubbling the exhaust gasses through a liquid to capture the CO2. The liquid is heated to release the carbon dioxide to an amount similar to what a soda can emits as it warms. This process is so power intensive that it takes up nearly one third of the total energy production of a power plant which can make it impractical.

Researchers at the University of Wyoming have invented a way to bring down the power requirement for amine scrubbing. They have done this by using active carbon and carbon nanotubes as catalysts for enhancing CO2 absorption and desorption kinetics of the liquid. In their experiments, the use of the catalysts largely increased the effective CO2 absorption time, the desorption kinetics and the desorption amount. This technology could make amine scrubbing feasible for large scale production.

Applications

Amine scrubbing helps to decrease emissions from powerplants by processing the CO2 emitted to almost eliminate it. The new catalysts reduce the amount of power required by amine scrubbing enough to make it feasible for large scale production.

Features & Benefits

- Enhances the CO2 absorption and desorption kinetics of the liquid
- Largely increases the effective CO2 absorption time
- Increases the desorption amount
- Makes amine scrubbing feasible for large scale production

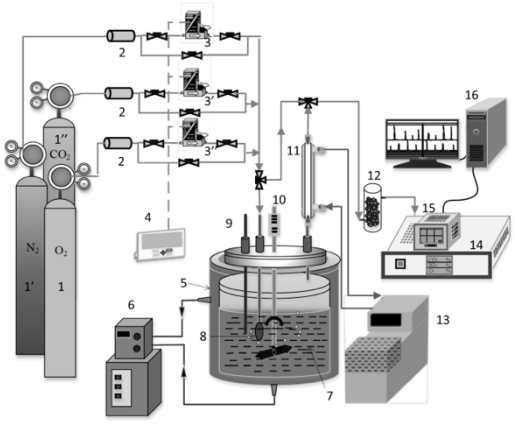

Figure: Schematic figure of MEA CO_2 absorption and desorption test setup (1: gas cylinders; 2: filters; 3: mass flow controllers; 4: mass flow controller control module; 5: furnace; 6: thermostatic water bath; 7: catalyst suspended in the solvent; 8: muffler for inlet gas; 9: thermocouple; 10: mechanical stirrer; 11: condenser; 12: moisture remover; 13: cooling unit; 14: gas analyzer; 15: data recorder; 16: computer).

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