



## Low Temperature Amine Regeneration Via Blending Volatile Alcohol into Amine Solution

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**Patent Status:**

Patent Pending

### Description of Technology

In order to reduce CO<sub>2</sub> 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 CO<sub>2</sub> as a product. Among the various CO<sub>2</sub> 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 CO<sub>2</sub>. 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.

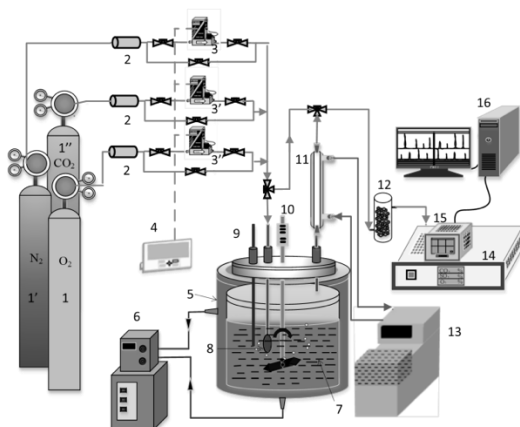
Researchers at the University of Wyoming have invented a way to allow amine scrubbing to work at much lower temperatures. They have done this by blending volatile alcohol into amine solution. This allows for better CO<sub>2</sub> absorption and desorption compared to regular amine solution. In one scenario, the alcohol blended amine solution had an 18.8 times increase in CO<sub>2</sub> desorption. These benefits make amine scrubbing achievable at 80 °C. This desorption temperature is so low that it can be achievable by utilizing existing waste heat from the power plant which would eliminate the need for extra energy sources otherwise needed for conventional amine scrubbing.

### Applications

Amine scrubbing helps to decrease emissions from powerplants by processing the emitted CO<sub>2</sub> to almost eliminate it. The new blended amine solution allows amine scrubbing to proceed at a much lower temperature than normal. The operating temperature is also so low that it will run off of waste heat allowing the reaction to run with no extra energy input.

### Features & Benefits

- Better CO<sub>2</sub> absorption and desorption
- Lowers reaction temperature of amine scrubbing
- Reaction can occur with only waste heat



**Figure:** Schematic figure of MEA based CO<sub>2</sub> capture 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: muffle 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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