Passive method for capturing atmospheric carbon dioxide

Technology #cu14298

Carbon capture is a promising approach for the removal of excess carbon dioxide from the atmosphere in an attempt to prevent and reverse climate change. Current approaches toward capturing carbon are focused on the point of production, specifically industrial and energy settings. However, these methods consume high levels of energy while ignoring the other major sources of atmospheric carbon dioxide. This technology utilizes a granular sorbent material for binding atmospheric carbon dioxide. Airflow through composite sheets brings carbon dioxide into contact with the surface of the sorbent material, where it binds. Furthermore, the material can release carbon dioxide in a concentrated form following simple humidity swings produced by the presence of water vapor. The technology and associated method enables passive capture of carbon dioxide directly from atmospheric airflow.

Sorbent material supports a low energy, scalable method for capturing carbon dioxide directly from the atmosphere

This technology captures carbon dioxide directly from atmospheric airflows. The atmosphere is the principal reservoir of carbon dioxide and source of global warming and climate change. However, most carbon capture techniques are designed and built for industrial and energy production settings, failing to address the atmospheric carbon dioxide sink. This technology captures carbon dioxide directly from the source of the problem, the atmosphere. In addition, the technique is largely passive and requires minimal energy input compared to current approaches. Furthermore, the composite material can be washed and replenished without disassembly of the composite structure. Therefore, the technology can be scaled affordably and efficiently.

A prototype of the technology has been tested and was shown to be highly efficient at capturing and concentrating carbon dioxide particles from airflow.

Lead Inventor:

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Applications:

- Removal and storage of atmospheric carbon dioxide
- Removal and storage of atmospheric particulates
- Concentration of carbon dioxide for biofuel production
- Concentration and compression of carbon dioxide for industrial/commercial applications (dry ice, compressed air, etc.)

Advantages:

- Capture of carbon dioxide independent of the production source (e.g. directly from atmosphere)
- Passive and low-energy
- Scalable - simple and affordable to operate

Patent Information:


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Related Publications:


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