



Empty Cups Could Help Capture Carbon

Description

Researchers have developed a new carbon-capture material using discarded plastics, which could help reduce greenhouse gas emissions. This advancement is significant as it addresses both plastic waste and environmental concerns.

The team tested the process on various plastic items, including Styrofoam, food packaging, and Lego. They found that the resulting material effectively captured carbon dioxide (CO₂) in both high and low concentrations, such as those found in industrial smokestacks and in the air.

The scientists were also able to adjust the material's properties by varying the levels of amine groups. These amines are chemical groups that can bond with CO₂. They explored using different synthetic materials to create amines, but found that some waste-derived amines performed less effectively in capturing CO₂ compared to those from polystyrene.

While the styrene-based material was successful, the alternative structures of amines derived from urethane foam and building trim did not perform as well. The researchers noted that, although the newer amines had lower CO₂ capture capacity, the potential to create carbon-capture materials from waste plastics still exists. This innovation could provide a viable solution for managing landfill plastic while also reducing the carbon footprint of carbon capture processes.

However, experts caution that carbon capture should not be seen as an excuse to continue using fossil fuels. Instead, it serves as an additional measure to tackle rising levels of CO₂ in the atmosphere, especially if carried out sustainably. Moving forward, the focus will be on optimising the sourcing and processes for creating effective amines.

Vocabulary List:

1. **discarded** //dɪs'kɑːdɪd// (adjective): thrown away because people do not want it
2. **emissions** //ɪ'mɪʃənz// (noun): gases released into the air from something
3. **amines** //ə'mi:nz// (noun): chemical groups that can bond with carbon dioxide
4. **polystyrene** //,pɒlɪ'staɪri:n// (noun): a common plastic used for foam and packaging
5. **landfill** //'lændfɪl// (noun): a place where trash is buried in the ground
6. **optimising** //'ɒptə,maɪzɪŋ// (verb): making a process work as well as possible

Comprehension Questions



Multiple Choice

1. What material was developed to help reduce greenhouse gas emissions?

- Option: Styrofoam
- Option: Carbon-capture material
- Option: Lego
- Option: Food packaging

2. Which items were tested for the carbon-capture process?

- Option: Only Styrofoam
- Option: Only food packaging
- Option: Various plastic items
- Option: Only Lego

3. What can amine groups bond with?

- Option: Oxygen
- Option: Water
- Option: Carbon dioxide
- Option: Plastic waste

4. Which type of amines performed less effectively in capturing CO₂?

- Option: Raw amines
- Option: Waste-derived amines
- Option: Synthetic amines
- Option: Styrene-based amines

5. What should carbon capture not be considered as an excuse for?

- Option: Reducing plastic waste
- Option: Using fossil fuels
- Option: Innovating new materials
- Option: Inventing new technologies

6. What was the successful material mentioned in the research?

- Option: Amines from urethane foam
- Option: Styrene-based material
- Option: Lego blocks
- Option: Food packaging materials



True-False

- 7. The new carbon-capture material is made using fresh plastics.
- 8. The researchers found that the carbon-capture material could capture CO2 in different concentrations.
- 9. All types of amines were equally effective in capturing CO2.
- 10. Experts believe that carbon capture can be an excuse to continue the use of fossil fuels.
- 11. Innovations in carbon capture involve managing plastic waste.
- 12. The focus will shift to optimizing the sourcing for creating effective amines.

Gap-Fill

- 13. Researchers have developed a new carbon-capture material using discarded plastics, which could help reduce _____ emissions.
- 14. The team tested the process on various plastic items, including Styrofoam, food packaging, and _____.
- 15. Amines are chemical groups that can bond with _____.
- 16. The potential to create carbon-capture materials from waste plastics still _____ exists.
- 17. Carbon capture serves as an additional measure to tackle rising levels of _____ in the atmosphere.
- 18. The research noted that some amines derived from urethane foam did not perform as well as those from _____.



Answer

Multiple Choice: 1. Carbon-capture material 2. Various plastic items 3. Carbon dioxide 4. Waste-derived amines 5. Using fossil fuels 6. Styrene-based material

True-False: 7. False 8. True 9. False 10. False 11. True 12. True

Gap-Fill: 13. greenhouse gas 14. Lego 15. CO2 16. exists 18. polystyrene

CATEGORY

1. Sci/Tech - LEVEL4

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