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Method to Synthesize Chabazite Zeolites with Controlled Aluminum Distribution

A controlled synthesis method creates an optimized chabazite structure for improved sequestration of NOx pollutants from diesel engine exhaust, reducing emission levels.

The percentage of harmful compounds in air has increased dramatically over the past hundred years, leaving very little room for clean air. Nitrogen oxide (NOx) levels have increased along with carbon monoxide and carbon dioxide. This is worrisome for the future given a steady increase in these levels will result in a hazardous living environment. Not only do these harmful gases increase global warming, but they also pollute breathable air. Research is being extensively performed to look for synthetic sequestration methods that will rapidly reduce the level of greenhouse gases more quickly than Earth's natural methods.

Researchers at Purdue University have developed a method of synthesizing chabazite, a common zeolite, by controlling the framework of key elements such as aluminum and silicon. Chabazite, natural or artificial, can be used to reduce the levels of NOx pollutants that are formed and emitted through diesel engine exhaust. Through this controlled method of synthesis, an optimum chabazite structure can be formed, allowing for better sequestration of NOx pollutants. The production of such material can reduce emission levels and bring down the level of harmful gases in the air, leaving a clean living environment.

To view a video related to this technology, click on this link: https://youtu.be/aUKoT6TkVWg

Advantages:

-Nitrogen sequestration

-Easily replicated

Potential Applications:

Technology ID
2016-GOUN-67299

Category
Automotive & Mobility
Tech/Internal Combustion Engine Optimization
GreenTech/Environmental Remediation & Pollution Control
Chemicals & Advanced Materials/Materials Processing & Manufacturing Technologies

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-Clean air initiatives

-Manufacturing plant exhaust systems

-Adsorption

Related Publications:

Christopher Paolucci, et al. Dynamic multinuclear sites fromed by mobilized copper ions in NOx selective catalytic reduction. Science DOI: 10.1126/science.aan5630 (2017).

TRL: 4

Intellectual Property:

Provisional-Patent, 2015-10-20, United States | Utility Patent, 2016-10-19, United States

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