

Case ID:M16-109P^

Published: 2/26/2020

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Simultaneous CO₂ and NO Control / Nitrous Oxide Generation Technique

Controlling products like carbon dioxide from combustion systems can help chemical manufacturers adjust to the recent limit on carbon emissions by the Environmental Protection Agency. Existing control techniques use carbon dioxide as feed to generate reusable chemicals thus reducing emissions. However, manufacturers use expensive modified combustion units or chemical reducing agents at high temperatures to control other post-combustion products like nitric oxide. Therefore, there is a need to leverage post-combustion products in order to create reusable chemicals, reduce environmental concern, and minimize cost of production.

Researchers at ASU have developed a technique to simultaneously control nitric oxide and carbon dioxide post-combustion and subsequently generate nitrous oxide. Ultraviolet (UV) rays from the sun chemically activate an inexpensive catalyst, a cheaper alternative for initiating combustion. In addition, nitrous oxide yield varies with the choice of catalyst, suggesting that the catalyzing agent can produce a desirable level of nitrous oxide through chemical tuning. A gas detection device in the reactor then tracks gas levels, providing a reliable benchmark for analyzing and tuning the catalyst to determine a profitable nitrous oxide output.

Potential Applications

- Gas, oil refining, and alternative energy
- Medical industry
- Pulp and paper industry
- Gas separation and storage
- Waste management services

Benefits and Advantages

- Photoresponsive Catalyst – Sunlight and an inexpensive catalytic agent can control nitric oxide, reducing cost and simplifying operation
- Simultaneous Control – Joint regulation permits dual conversion of combustion products to reusable forms, further reducing cost
- Sustainable Production – The method generates nitrous oxide, a valuable chemical resalable to semiconductor companies or gas purification companies that prepare it for medical use

For more information about the inventor(s) and their research, please see:

[Dr. Jean Andino's directory webpage](#)

