



# Enhanced Chemical Looping Combustion for Methane Reformation with CO<sub>2</sub>

**UW ID: 15-078**

**Inventors:** Maohong Fan  
Mingchen Tang  
**Patent Status:** Patent Pending

## Description of Technology

Carbon dioxide (CO<sub>2</sub>) is recognized as being the leading contributor to global warming. The combustion of fossil fuels constitutes the majority of greenhouse gases in the atmosphere. To combat this trend, University of Wyoming researchers are developing more efficient and affordable methods for CO<sub>2</sub> capture and sequestration. Chemical looping combustion in particular, is a promising approach.

The current invention suggests that with the introduction of one or two proposed rare earth oxides as catalysts, the reaction performance of typical oxygen carriers such as iron oxide or aluminum oxide for methane oxidation and carbon dioxide splitting, is significantly improved. Further, this process utilizes produced carbon dioxide streams for the replenishment of oxygen-depleted oxygen carriers.

## Applications

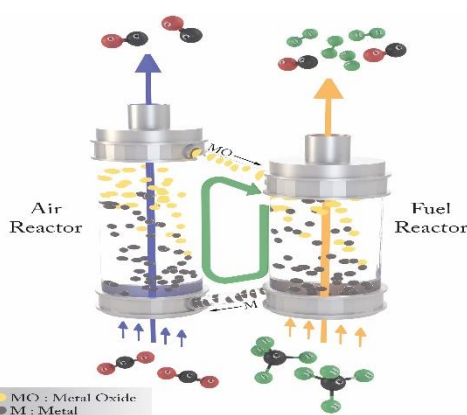
This chemical looping combustion method is applicable in the energy industry for carbon dioxide capture and sequestration.

## Features & Benefits

- Combats greenhouse gas emissions
- Economically sustainable
- Re-use of produced CO<sub>2</sub>

## Market Opportunity

Increased global greenhouse gas emissions has resulted in an escalated demand for CO<sub>2</sub> capture and sequestration. Current processes pose several challenges including coking and sintering problems. Long-term effects have also not been thoroughly studied. The proposed technology combats many of the current problems and produces purer CO<sub>2</sub> streams to be re-introduced into the chemical reactions.



## Contact Us:

**Research Products Center**  
1000 E University Ave  
Laramie, WY 82071

307-766-2520  
Fax: 307-766-2530  
Email: WyomingInvents@uwyo.edu