



Highly Active and Stable Supported Nickel Catalyst by Sol-Gel Technique for Dry Reforming of Methane

UW ID: 17-139

Inventors:

Sachin U. Nandanwar
Yunkai Zou
Joseph H. Holles
Jing Zhou

Patent Status:

Patent Pending

Description of Technology

The world's energy demand is continuously increasing due to the rapid increase in population and technology. Because of this high demand, nonrenewable fossil fuels are being used and the requirement for reducing greenhouse gasses is increasing. Dry reforming of methane (DRM) is a promising technology which uses two greenhouse gasses, CO and H₂, to create syngas, a combustible fuel. Currently, the DRM reaction is carried out at high temperatures in the presence of catalysts. However, there is currently a global challenge to develop a thermally stable and active catalyst that can carry out the reaction at reduced temperatures.

Researchers at the University of Wyoming have invented a Ce₁xTi_xO₂ supported nickel catalyst to be used in DRM. The catalyst is made using the sol-gel technique. This is a way of getting a gelatinous material out of a liquid at room temperatures. This catalyst works in DRM at temperatures as low as 600 °C and can last for up to 50 hours without showing much activity loss. The CH₄ conversion and H₂ yield for the DRM reaction is 68% and 47% respectively. The overall study of this catalyst suggests that it is active and stable enough for dry reforming methane in industrial applications.

Applications

This technology can be used to dry reform methane much more economically. Because the catalyst lowers the temperature of the reaction and last for a long time without much activity loss, much less energy needs to be put into the reaction.

Features & Benefits

- Lowers the temperature of DRM
- Long lasting
- Active and stable enough for industrial applications

Contact Us:

**Wyoming Technology Transfer and
Research Products Center**

1000 E. University Ave
Laramie, WY 82071

Tele: 307-766-2520

Fax: 307-766-2530