



Method for Synthesis of Formaldehyde from CO₂ Reduction

UW ID: 16-076

Inventors:

Maohong Fan

Yueli Wen

Bin Wang.

Patent Status:

Patent Pending

Description of Technology

Formaldehyde (HCHO) is an important precursor to many other materials and chemical compounds which can be used in the production of industrial resin, urea formaldehyde resin, melamine resin, phenol formaldehyde resin, polyoxymethylene plastics, 1,4-butanediol, and methylene diphenyl diisocyanate. Presently, formaldehyde is mainly synthesized from oxidation of methanol over silver or over a mixture of iron and molybdenum or vanadium catalysts. This technique has traditionally been used for industrial production of formaldehyde.

Development of efficient catalysts to promote the yield and selectivity of formaldehyde has been important to many researchers in the field. Researchers at the University of Wyoming have recently developed a highly effective method for synthesis of formaldehyde from carbon dioxide by decomposing water in a fixed-bed reactor. The new method uses a popular fix-bed reactor; all the parts are contacted with both H₂O and CO₂. The catalyst used in the new method can be an active or non-active metal. It could also be a mixture of active metal and metallic oxides.

Applications

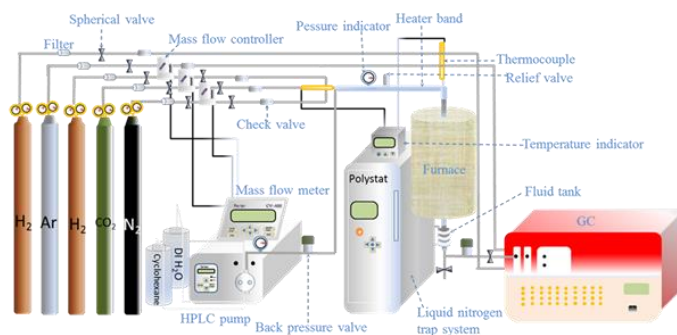
Applications include the efficient and continuous production of formaldehyde for use in materials and industrial chemicals. An even more important application is in processes for converting and utilizing carbon dioxide, for a low-cost, ideal way to mitigate concentrations of carbon dioxide released into the atmosphere in other separate processes and applications.

Features & Benefits

- High CO₂ conversion and formaldehyde selectivity is obtained
- Lower cost than past methods
- Requires only mild reaction temperatures (40 °C to 350 °C) and pressures (300 Psi to 500 Psi)
- Carbon dioxide is converted to value-added chemicals

Marketing Opportunities

Materials, chemical synthesis, industrial processes, resins, plastics, catalysts, formaldehyde production and synthesis, carbon dioxide capture and conversion, value-added chemicals, reactors, metals, and metallic oxides.



Contact Us:

Research Products Center
1000 E University Ave
Laramie, WY 82071

Phone: 307-766-2520

Fax: 307-766-2530

Email: WyomingInvents@uwyo.edu