UNIVERSITY OF WYOMING
Wyoming Technology Transfer and Research Products Center

Low-Pressure Methanol Production from CO_2 Using Catalysts

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Patent Status:
Patent Pending

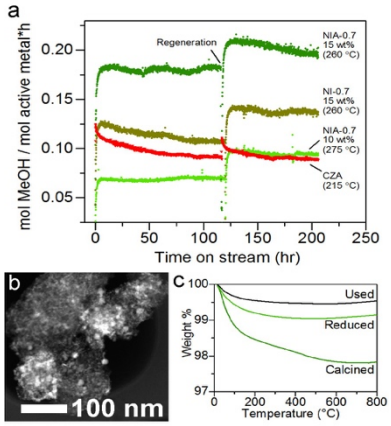
Description of Technology

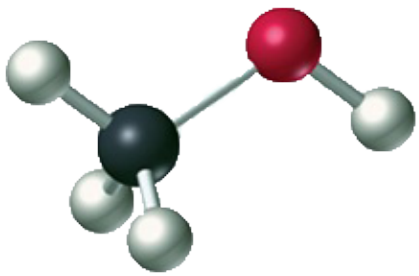
Increased atmospheric carbon dioxide levels have motivated research on CO_2 capture and how it can be used for beneficial purposes. Methanol (MeOH) is an organic compound used in alternative fuels and is in high demand globally. In the past, methanol has been synthesized from CO_2 directly and indirectly through a CO conversion process by using a reverse water-gas shift reaction, but this is usually optimized for high-pressure conditions using CO_2 and CO. There has been a need for an alternative catalyst to provide a more effective way to use CO_2.

Researchers at the University of Wyoming have developed a methanol synthesis catalyst that is designed to effectively utilize CO_2 for methanol synthesis at a low pressure with high stability and selectivity, without requiring precious metals. The new composite catalysts contain nickel and indium as co-catalysts and are synthesized via a phyllosilicate precursor. The metals used in this process have advantages in both their catalytic and structural attributes.

Applications

- The required H_2 can be obtained using renewable energy resources such as biomass and solar based water splitting. The methanol produced by this process is renewable and has the potential to be a fossil fuel replacement.
- Low pressure CO_2 and H_2 based MeOH synthesis catalysts means synthesis that is not only less energy-intensive, but can also be beneficial to development of other energy technologies such as direct methanol fuel cells





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