CATALYSTS FOR THE CONVERSION OF SYNTHESIS GAS TO HIGHER ALCOHOLS

Opportunity

Researchers at the University Saskatchewan have developed a new catalyst and process for selective synthesis of higher alcohols with a carbon number greater or equal to two. Higher alcohol fuels produce more energy for a given mass of fuel than lighter methanol or ethanol. The new Co-Rh-Mo-K catalyst supported on multi-walled carbon nanotubes adds significant value to the process.

Benefits

- Cost efficient process selectively produces higher alcohols.
- New active, stable and efficient pelletized catalyst.
- Use of multi-walled carbon nanotubes (MWCNTs): High surface area, porous nature and attractive textural properties of MWCNTs enhance loading, diffusion and subsequent heavy metal dispersion during higher alcohol synthesis.

Publications

Boahene PE, Surisetty VR, Sammynaiken R, and Dalai AK. Higher Alcohol synthesis Using K-Doped CoRhMoS2/MWCNT Catalysts: Influence of Pelletization, Particle Size and Incorporation of Binders. Topics in Catalysis 2013 (December).

Background

Catalytic conversion of synthesis gas to alcohols is advantageous as synthesis gas can be produced using forest, agricultural surplus, and household waste and does not compete with the feed grains available for human need or use finite resources.

Gasification with syngas conversion to alcohol represents one of the cellulosic pathways to produce biofuels. The process allows the use of feedstock biomass which is heated and converted into syngas. A wide range of feedstocks may be used in this process. The yield of the syngas conversion into alcohol is 80-111 gallons valued at $0.24 per gallon.

The process of conversion has low operating costs but because the industry is extremely price sensitive further improvement of the technology is necessary to overcome the economic constrains of production costs.

Patent status

US patent application # 13/457893 was filed on April 27, 2012, Canadian patent application # 2739142 was filed on May 6, 2011, Australian Patent application # 2011101096 was filed on May 6, 2011.

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