Liquid fuel production from Coal/Biomass derived Syngas

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BACKGROUND

Research is being conducted world-wide to develop new technologies for the generation of energy from different resources. Coal gasification – and virtually gasification of other carbon-based resources such as coal– is a versatile conversion technology adding flexibility to the energy systems. In the coal gasification reactors, the feedstock is converted into a synthesis gas (syngas), a mixture of H₂, CO and CO₂ which enables the production of a variety of downstream energy carriers. Fischer–Tropsch synthesis (FTS) is a process which converts syn-gas (H₂ and CO) to synthetic liquid fuels and valuable chemicals. Pakistan imports liquid fuel to c.a. 15 M bl/annum costing the exchequer wobbling USD 15.0 M to power the transport, aviation and marine sector. The development of novel catalysts with high activity and selectivity is desirable as it leads to improved quality and value of FTS products.

RESULTS & IMPACT

Carbon supported Iron catalyst With K Promoter

CONCLUSION & RECOMMENDATIONS

- Developed a cheap and effective Carbon based Fe catalyst with K promoter for FT process.
- The liquid product composition is Gasoline (76 %), Diesel (23.9 %) and waxes ( < 1).
- The total percentage of different hydrocarbons in the mixture is (C5-C7) is 9% and (C8-C23) is 91%.
- Oxygenates are only 11% of total liquid product.
- Carbon based Fe catalyst without K promoter gave less selectivity as compare to promoted catalyst.