NCL scientists show the way to tackle energy crisis

Convert Methane, Methanol Into Gasoline

By Siddhartha D. Kashyap/TNN

Pune: Scientists at the National Chemical Laboratory (NCL) have achieved a major breakthrough by successfully converting methane and methanol into gasoline.

While efforts are under way to demonstrate this conversion to prospective industry partners, including Shell Research Corporation, for technical evaluation, the scientists say the development is an answer to increasing energy demands and shrinking oil reserves.

Vasant Choudhary from the NCL's chemical engineering and process development division, who got a US patent for the conversion in April 2006, said while laboratory tests have been successful, efforts would be made to scale up, before the technology can be made available commercially.

Vasant Choudhary

Shafeek Mulla

"Although there have been attempts to transform the naturally available methane into liquid hydrocarbons, scientists have not been able to achieve the desired results," Prof. Shafeek A.R. Mulla from NCL told TOI. "I think we now have an answer to worldwide efforts to develop alternative methods for conversion of methane into value-added products like liquid hydrocarbon fuels (gasoline)."

Conversion was tried before, P3

Methanol-to-gas was tried before

By Siddhartha D. Kashyap/TNN

Pune: The prevalent route for transformation of methane into liquid hydrocarbons - methane-syngas-methanol-gasoline - is based on the methanol-to-gasoline (MTG) process. However, scientists at the National Chemical Laboratory (NCL) have achieved the process through a non-oxidative activation of methane gas and methanol.

The prevalent process is not only highly exothermic (where heat is evolved, thereby posing difficulty in industrial purposes), the conversion also results in formation of toxic benzene formation.

Vasant Choudhary from the NCL's chemical engineering and process development division said that a few years ago, Mobil Corporation had experimented the use of methanol-converted gasoline in New Zealand, but found the process unfeasible. "This is a high technology development area, where we have achieved the conversion under normal conditions without heat being evolved and insignificant formation of toxic benzene."

Choudhary and Shafeek A.R. Mulla from NCL recently published details of the conversion in the internationally-acclaimed chemical journal, *Angewandte Chemie International Edition*, which is published from Germany.

"The NCL process is not only energy efficient, but also endothermic," Mulla said. In this process, methane is converted at low temperature (600 °C) over bifunctional zeolite catalysts, he added.

While the applications of this conversion are many, including using this gasoline to run vehicles, Choudhary said the process would also largely help tap the vast unused reserves of naturally available methane gas, which is considered to be one of the key greenhouse gases responsible for global warming.

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