GTL TECHNOLOGY OVERVIEW

Cal Tech International Inc has acquired international rights to a breakthrough new GTL (Gas To Liquid) technology developed in the former Russian empire . This new GTL Technology permits the conversion of natural gas to petroleum liquids such as methanol, benzene kerosene, diesel oil, gasoline, and so forth without going through an intermediate synthesis process. This research breakthrough was privatized in 2000**.**

This technology is the culmination of many years of development in pre and post Soviet times carried out by scientists employed with the Russian Space Agency and the Academy of Sciences.

PRIMARY PRODUCTS

The direct oxidation of natural gas in the proprietary reactors enables the production of methanol, formaldehyde, ethyl alcohol, gasoline, diesel and many other carbon derivatives.

The major benefits in utilizing this technology is the elimination of very costly preliminary transformation of a gas to [synthesis] as used in existing systems available today in the market. The resultant capital costs savings are up to 70% relative to existing systems and its higher efficiency lowers production costs making it competitive at current, lower crude prices.

PROCESS DESCRIPTION

A compressor takes (X) cubic meters /hour of natural gas from the main gas pipeline and deliver it to the inlet of a circulating compressor, which then compresses the gas up to an operating pressure of 75 atmospheres. The gas stream is heated in a heat exchanger up to an operating temperature of 450 degrees centigrade [840 degrees Fahrenheit]by the heat of the reaction and is then delivered to the inlet of a bit-slice reactor- and a generator feeds oxygen into the reactor simultaneously. The reaction gas, having passed through three phases of oxidation and through the heat exchanger, is cooled and directed to a separation stage where the liquid products are extracted.

The gas fractions are delivered to the inlet of a circular compressor again. The liquid product of the oxidation process is then fed into a rectification unit where engine fuel corresponding to 98 octane gasoline is extracted or to whatever other carbon based products are required.

The oxidation process gas needs to be cooled by a cooling agent. Water is used as the agent for this purpose. The water takes off the heat from the reaction and is converted into high parameter steam (P=40 atmospheres, T=400-500 degrees centigrade). Part of this heat energy is used for our own consumption in warming the rectification columns. The balance can be sold to other users requiring this energy. If necessary, the plant at the gas field or other location can generate electricity for supplying heat to residential buildings and industrial and commercial units.

Moreover, the technology of direct oxidation of carbohydrate gases, developed by GTL can use not only natural gas, but also a range of accompanying gases of oil extraction, flare gases and secondary gases of oil refineries for gas processing plants and petrochemical plants. In addition, the technical solutions of this new technology make it possible as part of big oil and gas production, oil refining and petrochemical complexes as well as small gas fields of which it is totally uneconomic to develop due to the significant costs for transport.

COMPARISON VS. EXISTING SYSTEMS ON THE MARKET

The main competitors in this market are Syntroleum, Sasol, Chevron, Exxon, Mobil, Shell, Rectech, BP, Tessay, and others.

The technology utilized by these companies is generally based on further improvements in the first generation of gas to liquid plants constructed in the 80s, and 90s. This basic approach is to produce a synthesis gas using the Fisher – Tropsch method, using very expensive cobalt catalysts, which require the gas to be free of sulfur (less than 0.0001%), of which sources are very difficult to find. In addition, the catalysts have to be changed on a regular basis. Most gas deposits contain varying degrees of sulfur.

In the case of the GTL Technology, our system can handle gas with sulfur, which provides greater opportunities for the technology. Moreover, the synthesis gas process is mainly used to convert gas into other products as the economics of building pipelines have become very expensive in today's market. To put it another way, the more expensive the natural gas is, the more profitable it is to send through a pipeline.

However, not all gas fields are economic to develop—for example, small deposits that require significant investment to develop. The alternative is to consider using our system which is modular in design and produces petroleum products which are easy to transport.

MEETING THE MARKET NEEDS

- Direct oxidation represents a system that is 70% cheaper in capital investment for the same capacity unit.
- Indifference to various impurities, like sulfur
- No hindrance on further development of the process and in increasing production capacity
- No requirement for highly-qualified technical staff
- Cheaper to operate
- Ecologically safe; major contributor to reduction in greenhouse gases
- Energy saving
- Modular units to allow small scale and large scale production
- Low price of production of end products- greater profitability.

CAL TECH INTERNATIONAL
GTL TECHNOLOGY PROVIDES THE SOLUTION

- Derivatives Direct Oxidation of Natural Gas to Produce:
- Methanol
- Gasoline
- Diesel
- Jet Fuel
- Formaldehyde
- Most Carbon

THE GTL TECHNOLOGY BENIFITES

1. Cost
2. Finished Product
3. Proven Technology
4. Modular units to allow small scale and large scale production
5. Plant Mobility
6. Production Simplicity
7. Wide range of finished products
8. Indifference to various admixtures, like sulfur
9. No requirement for highly qualified technical staff
10. Cheaper to operate
11. Energy saving
12. Low price of production of end products- greater profitability.
13. Ecologically safe- major contributor to reduction in greenhouse gases
14. No hindrance on further development of the process and in increasing production capacity