

### GTO(Greenhouse gas-To-Olefin) process for olefin production from alternative feedstock of naphtha

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Various methods for reduction of greenhouse gases such as CH<sub>4</sub> and CO<sub>2</sub> have been developed due to their global warming effect. Among the efforts of reduction of greenhouse gases, combination of methane (or CO<sub>2</sub>) reforming and Fischer-Tropsch (FT) process has been most extensively studied to produce alternative liquid feedstocks due to the rising oil crisis. Premium naphtha, diesel, gasoline and so on could be produced by GTL, CTL, or BTL process. In this work, we will introduce the novel olefin production process, GTO (greenhouse gas to olefin). GTO process consists of consecutive integrated three units of CH<sub>4</sub> and CO<sub>2</sub> reforming unit for syngas production, FT unit, and olefin cracking (OC) unit for maximizing light olefin production. It is expected that GTO process can not only reduce greenhouse gases but also produce olefins. The lab-scale GTO process showed 50% of light olefin selectivity in produced hydrocarbons. It is noticed that 1kg of CH<sub>4</sub> can produce more than 0.3kg of light olefins and 0.2kg of other hydrocarbons. Three different catalysts for reforming, FT and OC were tested and characterized in GTO pilot plant with maximum olefin production rate of 10kg/day.