

## New Gas-To-Liquid Catalytic Technology using Carbon Dioxide

**Project Leader :** Noritatsu TSUBAKI  
Prof., Academic Assembly Faculty of Engineering, University of Toyama

**R&D Team :** Nippon Steel Corporation



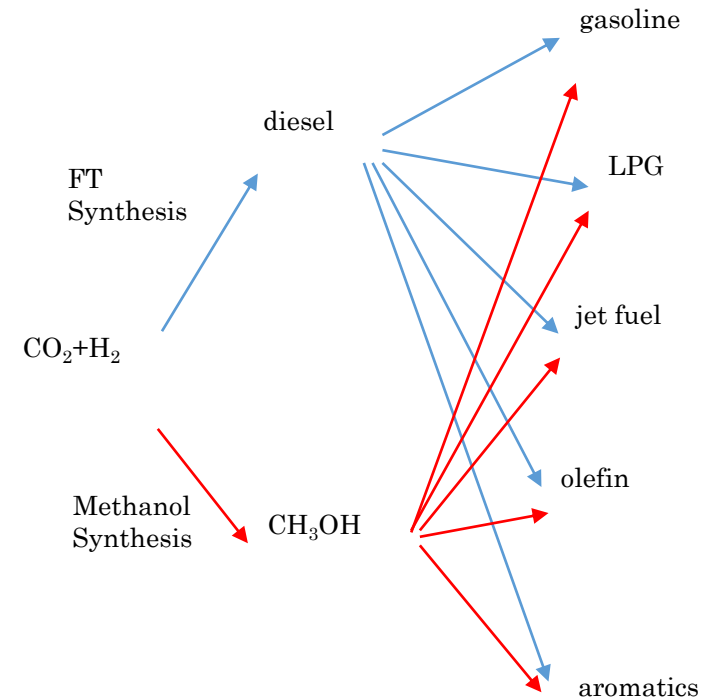
### Summary :

The present carbon dioxide hydrogenation reactions such as methanol synthesis and FT synthesis need high temperature and high pressure, with low one-pass conversion theoretically. Furthermore, the water steam, a by-product in these reactions, will deactivate the employed catalysts quickly.

We will develop new carbon dioxide hydrogenation reactions at mild reaction conditions, with doubled conversion.

To realize our targets, new catalyst design to enhance catalyst activity and lifetime at mild reaction conditions is necessary. More importantly, new catalysis synthesis route as well as new type reactor is also necessary to develop, fitting the new tailor-Made catalysts.

We plan to convert carbon dioxide with hydrogen to diesel, LPG, gasoline, olefin, aromatics, jet fuel and alcohols.



Simple chemistry to efficiently convert carbon dioxide by hydrogenation.