Funded by the European Union

Applications of Biogas in Chemical Energy Storage and Liquid Fuel Production

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I. Project Road Map

AD for renewable energy production, waste management and green house gas reduction in Northern Ireland

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Biogas Reforming~ at 1bar

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Liquid Fuel Production (LFP)

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Fischer Tropsch Synthesis ~at 20 bars

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Can we achieve LFP at lower pressures?

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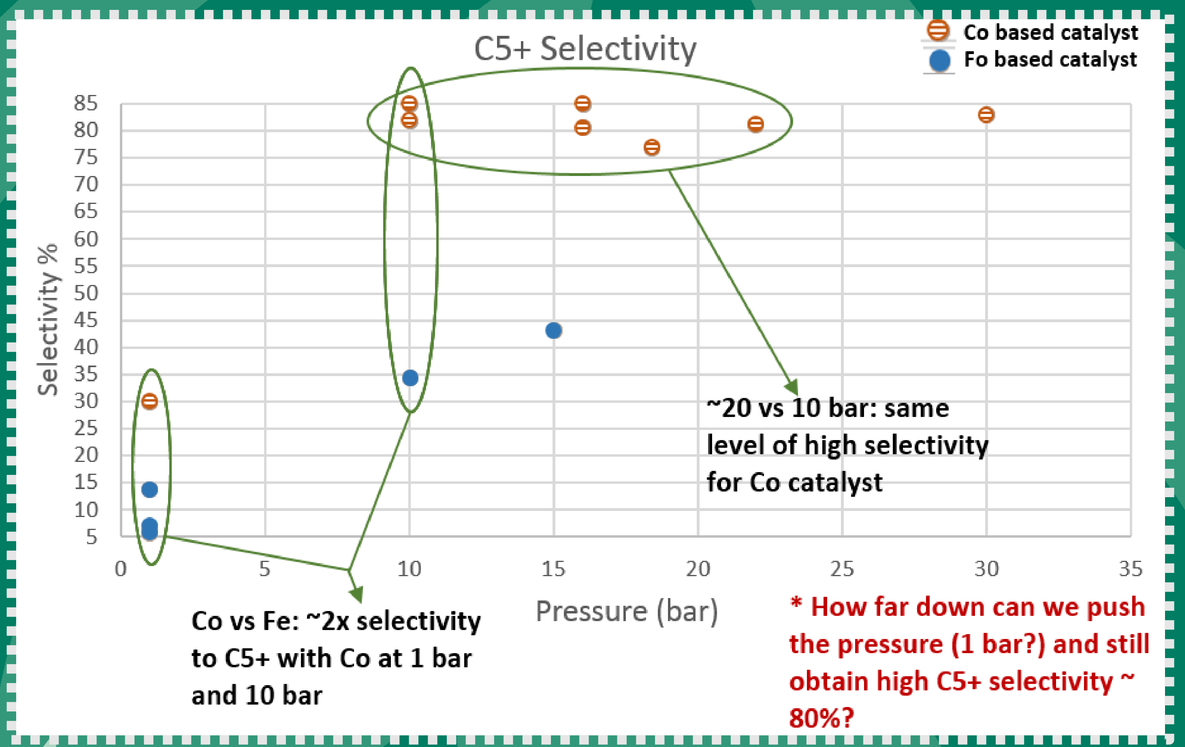
Catalyst is key!

Aims:

1. Reduce methane selectivity in FT
2. Achieve high selectivity of C5-C15 at low pressures (thus boosting production of liquid fuels)
3. Ramp up the pressures and study the gradual effect on the production of liquid fuels in terms of selectivity and conversion
4. Minimize FT operating pressure, thereby minimizing compression energy
5. Assess different catalysts for optimal selectivity



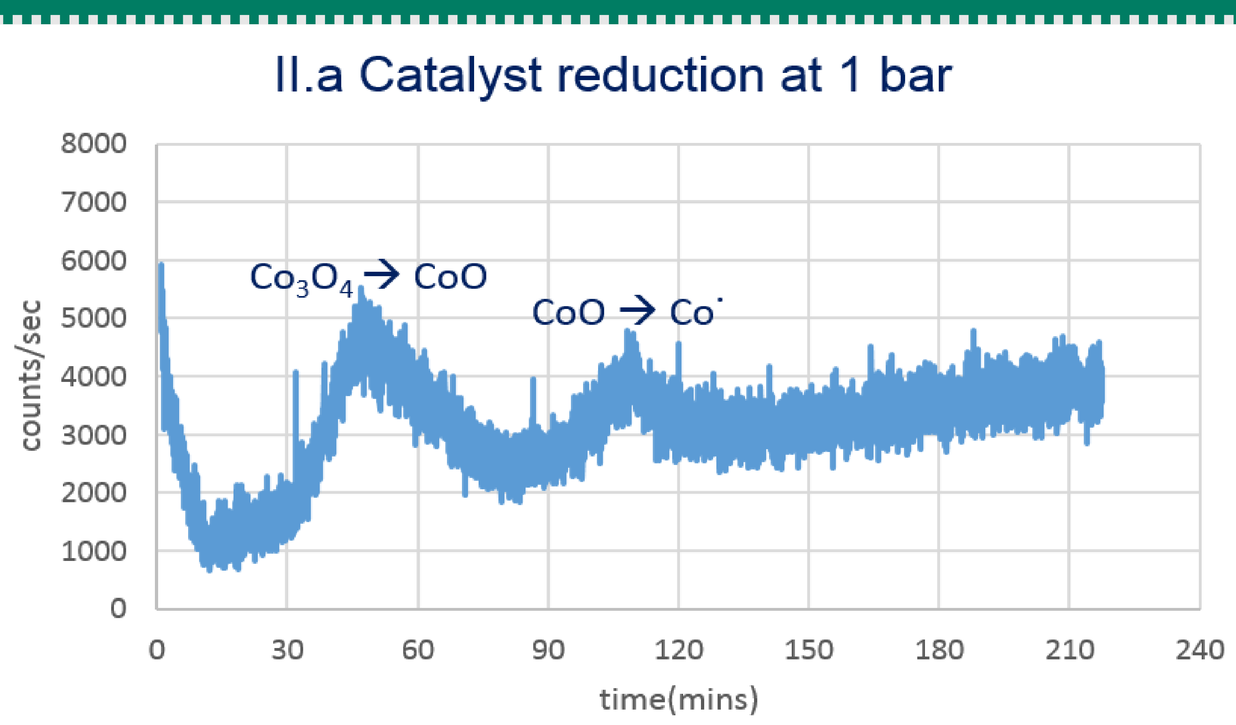
Self Preparation: Co Catalyst- 20%Co/Al_2O_3 by wet impregnation

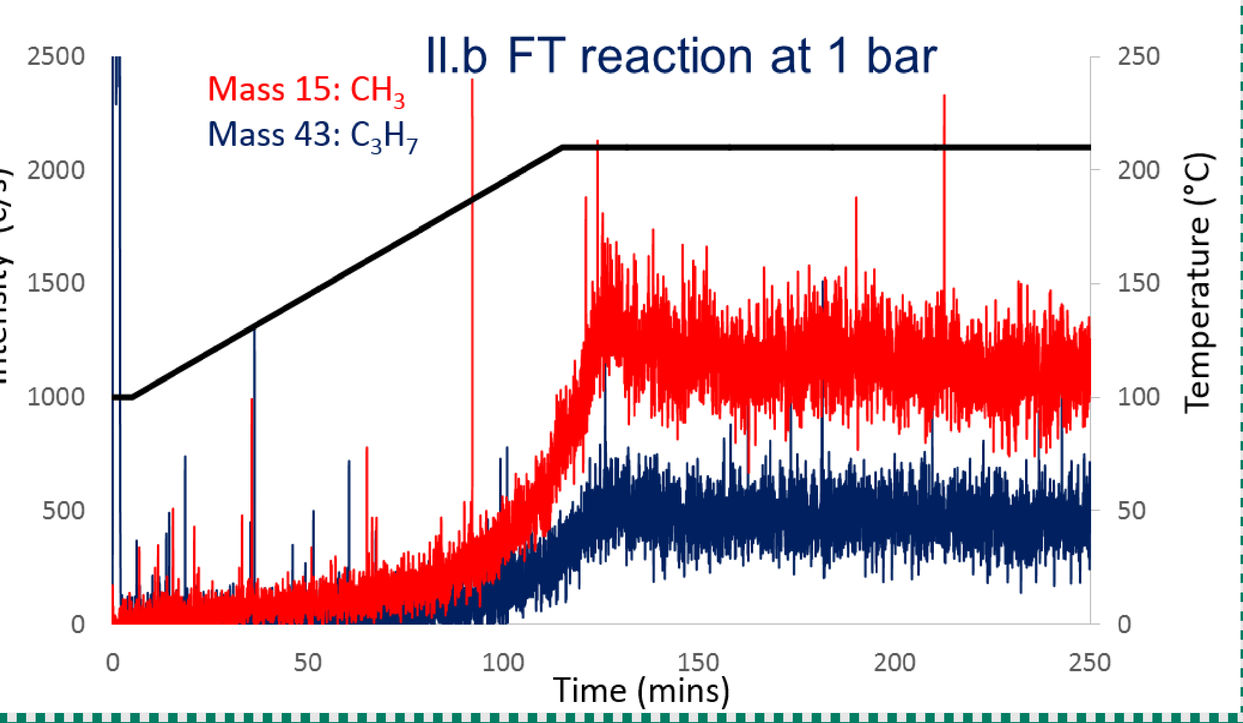
VS

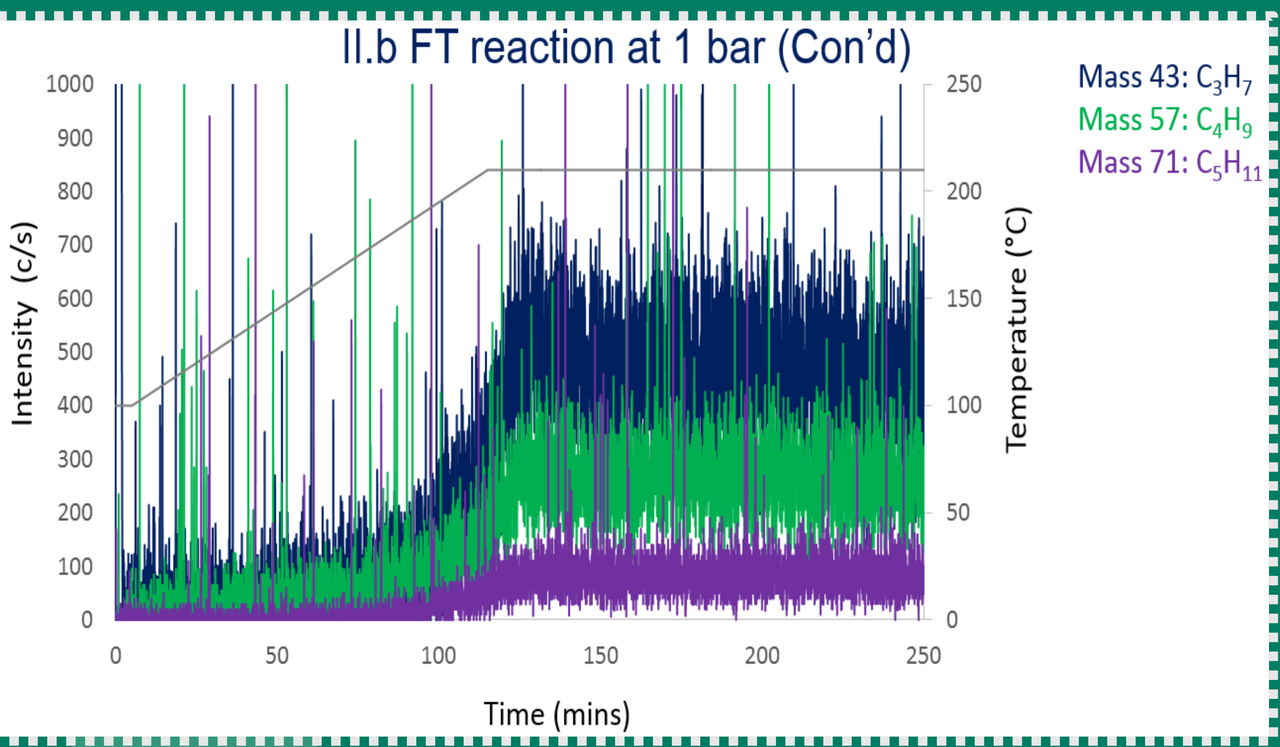
Commercial FT catalyst

A Gas Chromatogram (GC) is more suitable for the analysis

II. Experimental - Commercial Catalyst Testing Results using a Mass Spec







- Signal due to mass 15 (methane) largest of the hydrocarbon signals
- Fragments due to formation of higher hydrocarbons
- C3-C5 detected; C-C coupling products
- Rig is Operational!