



Aromatics Feedstock Supply? ...NO PROBLEM.

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Obtain Sufficient Feedstock Supply

■ Critical issue of the Aromatics Industry:

Obtain sufficient feedstock supply.

■ As,

- Pyrolysis gasoline aromatics availability is declining with the LPG based ethylene capacity coming on line.
- Most of the aromatics available from reformat is already being recovered.



Opportunities

■ Opportunities

- Significant resources of Aromatics remain in refinery cracked naphtha streams.
- Technology now exists to recover these aromatics; and to produce additional aromatics from the olefin-rich streams.



Present Business Climate

- Short to balanced on aromatics.
- Long on gasoline.
- Environmental pressures placing limits on olefin and sulfur contents in gasoline.



Purification of Aromatics

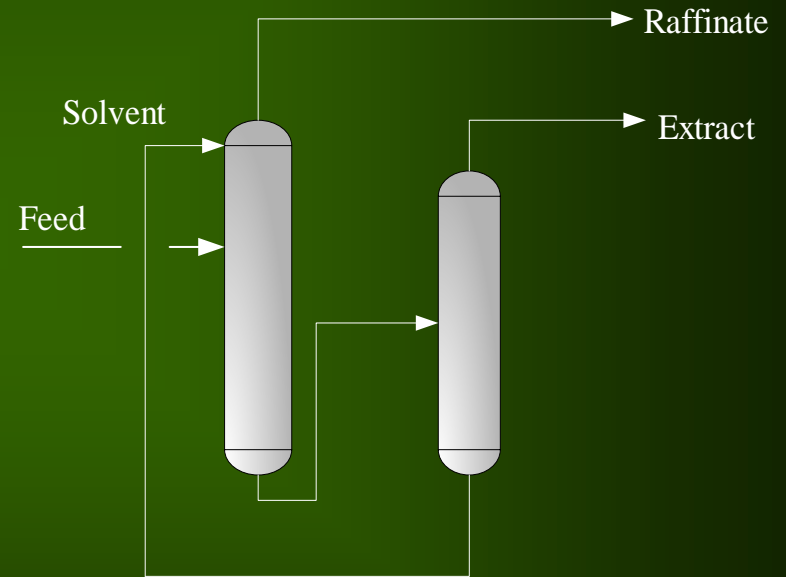
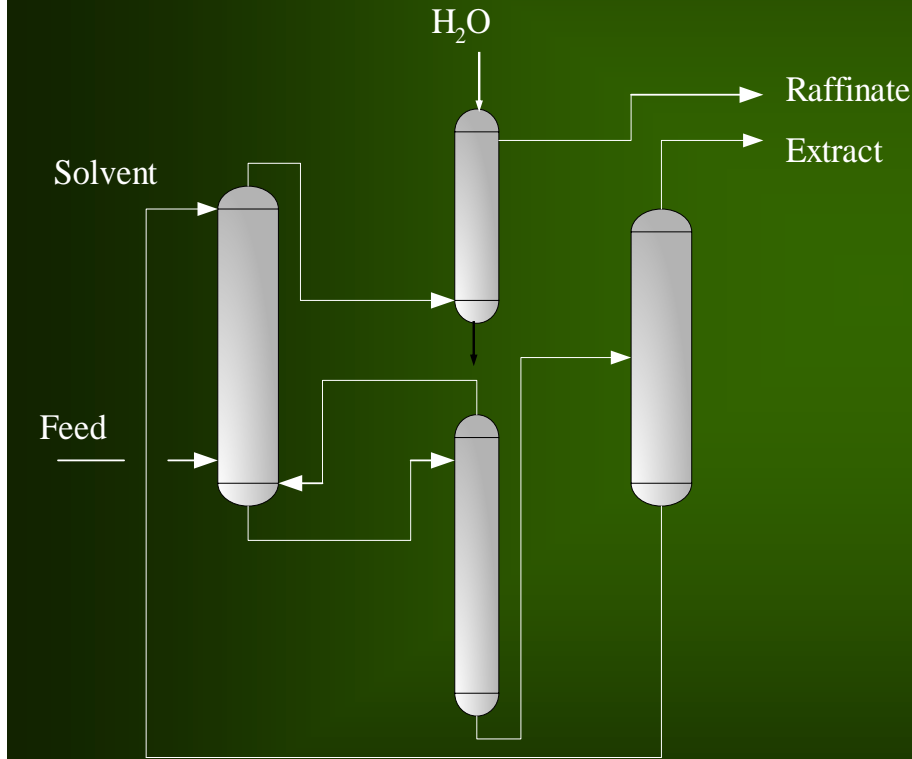
- Aromatics contained in hydrocarbon streams cannot be used directly in high purity applications.
 - Solvent extraction is required.
- **Liquid-liquid extraction:**
 - Mature technology with little potential for improvements.
- **Extractive Distillation:**
 - Selective solvent blends; **expand applications to olefin-containing streams.**



Aromatics Purification Technologies

Liquid-liquid Extraction

Extractive Distillation





Other Aromatics Streams In A Refinery

FCC Naphtha (Large volume available)

- Mid boiling range gasoline (C_6 - C_9) is rich in aromatics (~50%).
- Also contains significant amounts of thiophenic sulfur and high olefins (~30%).
- Coker Naphtha
- Hydrocracker Naphtha

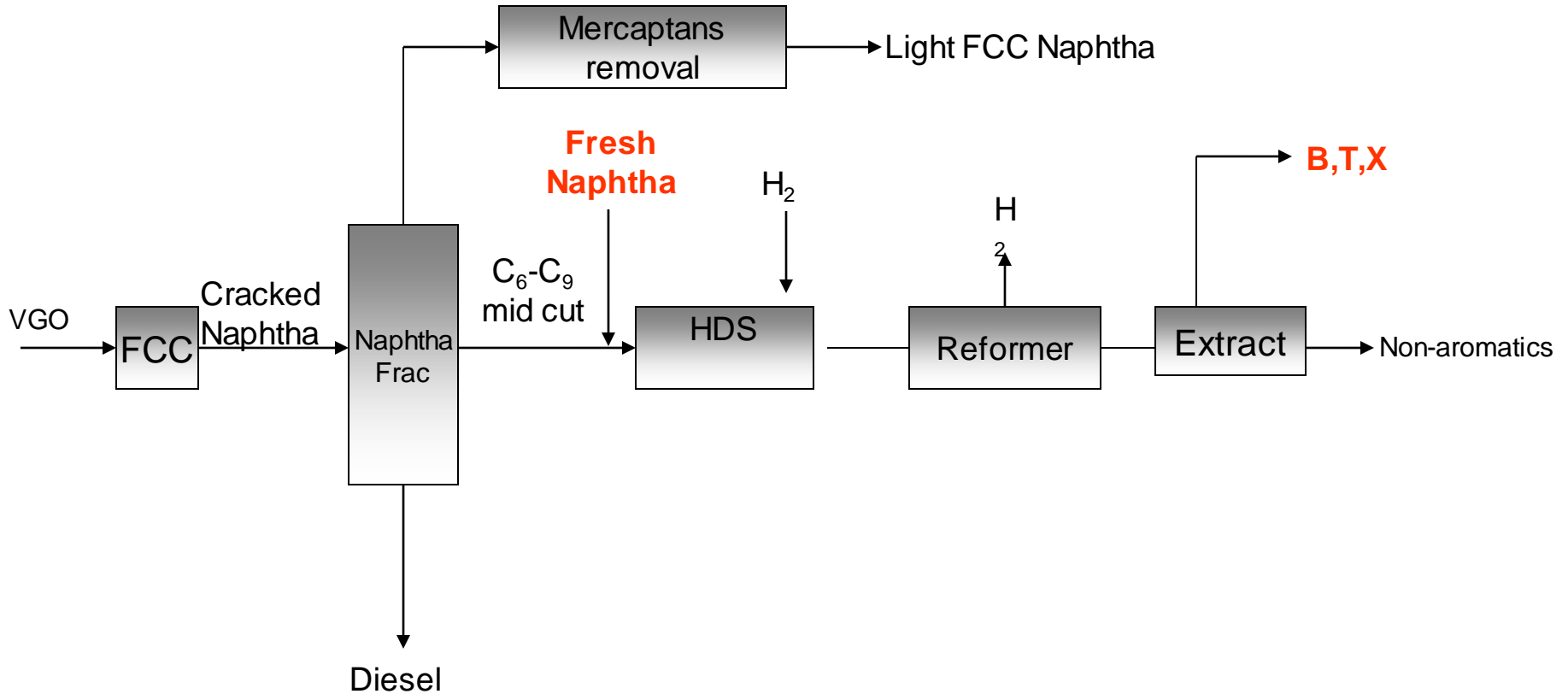


What Happens To These Streams?

- Typically hydrotreated to remove the sulfur species.
- Olefins are lost by hydrogenation.
 - Hydrogen consumed in the range of 50-200 SCFB.
- Octane loss of the gasoline.
- Sometimes reformed to move components to the aromatics plant.
 - Hydrogen balance is poor and contained-aromatics take a free ride.



Typical Refinery Process Scheme





Turn Them Into Revenue Streams

- A better use can be made of these materials and assets.
 - Recover more BTX Aromatics.
 - Reduce H₂ usage.
 - Greater efficient utilization of Naphtha Reformer.
 - Maintain Gasoline pool specification.

N + 2A = 120 Good reformer feed?



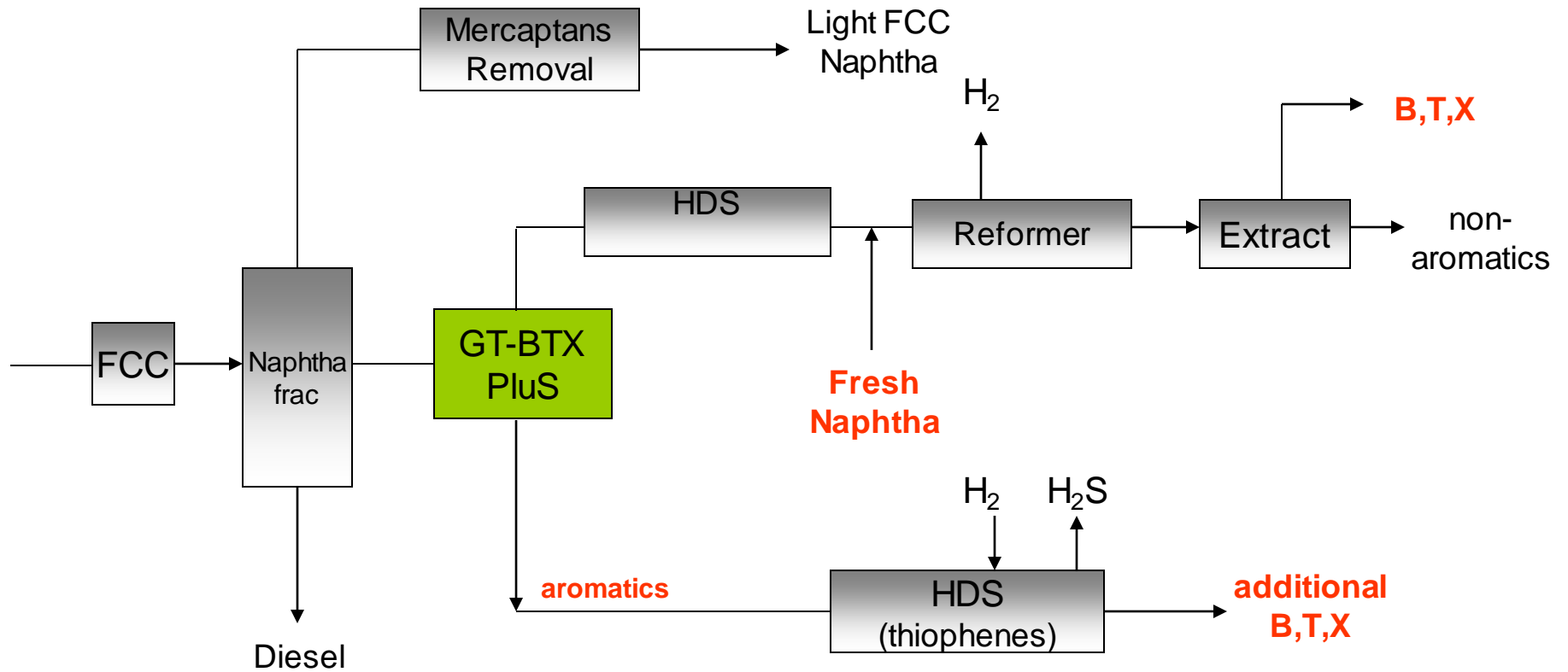
Introducing GT-BTX Plus

■ GT-BTX Plus

- Extractive Distillation technology for simultaneous recovery of BTX and thiophenic sulfur species.
- Optimally installed on the FCC mid-cut naphtha stream.



Apply GT-BTX PluS



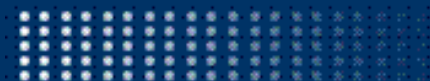


GT-BTX Plus Advantages

- Increases overall aromatics recovery by 10-15% of FCC BPSD throughput.
- Reduces H₂ consumption.
 - Only HDS function is required for thiophenic sulfur.
 - No olefin saturation.
- Greater utilization of naphtha reformer.
 - Avoids BTX taking a “free ride” through the unit.
- Opportunity to feed more fresh naphtha and generate more hydrogen.



Pushing Beyond The Edge



*“Can Aromatic yield be increased
still further?”*

The answer is **“Yes!”**



Introducing Aromatization Process

- By addition of an Aromatization Process...
 - For Aromatization of Olefinic hydrocarbon streams.
 - Increases further the aromatics yield.



Potential Feed Stocks

■ Olefins Crackers

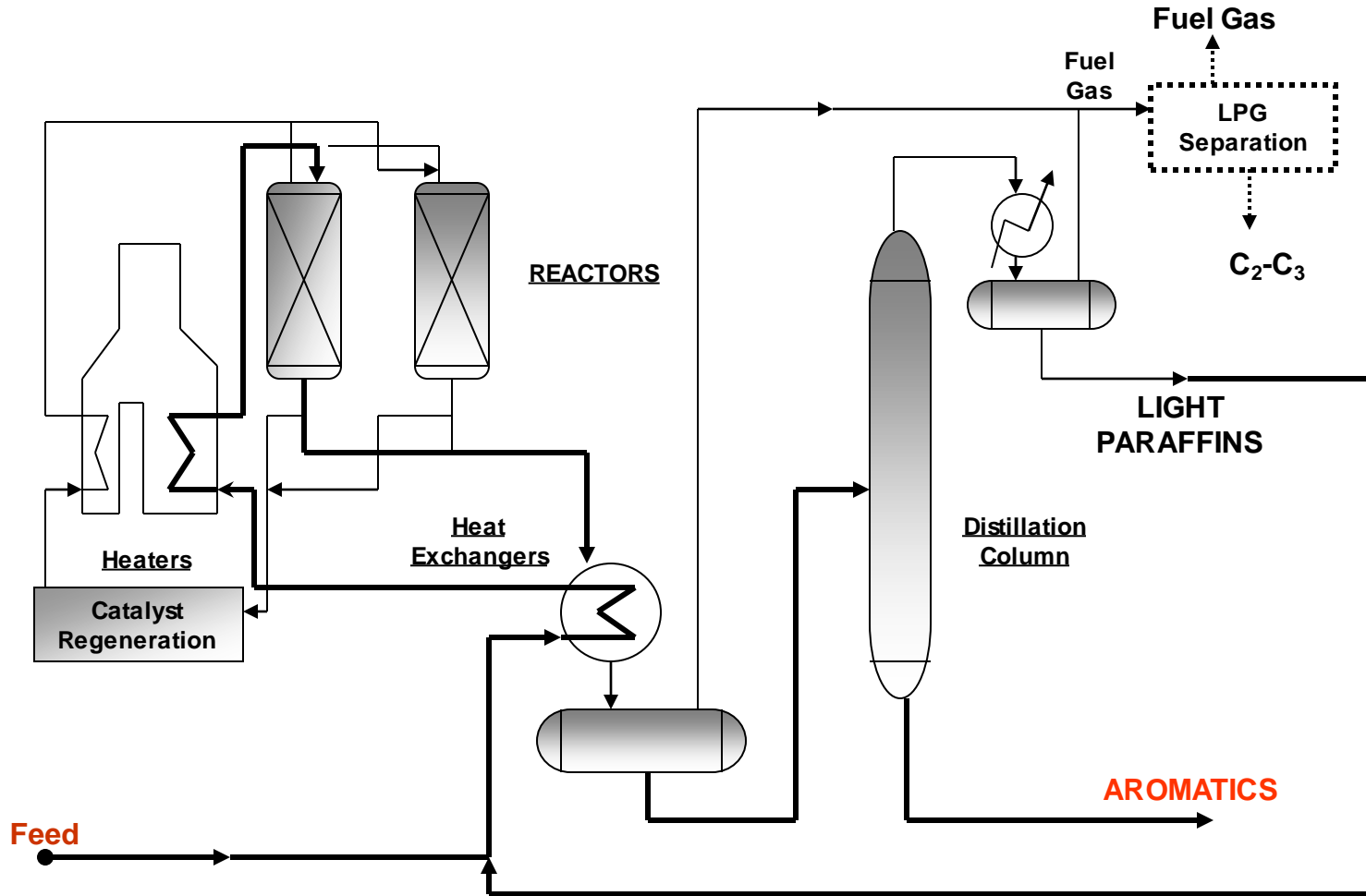
- C₄ Raffinates
- C₅ Raffinates
- Partially Hydrotreated Pygas.
- GT-BTX PluS Raffinate (Pygas)

■ Refineries

- FCC C₄-C₅ Cut
- Coker C₄ and Light Naphtha
- Hydrocracker Naphtha
- GT-BTX PluS Raffinate (FCC)

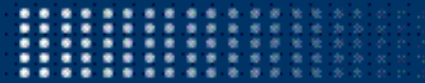


Aromatization Process



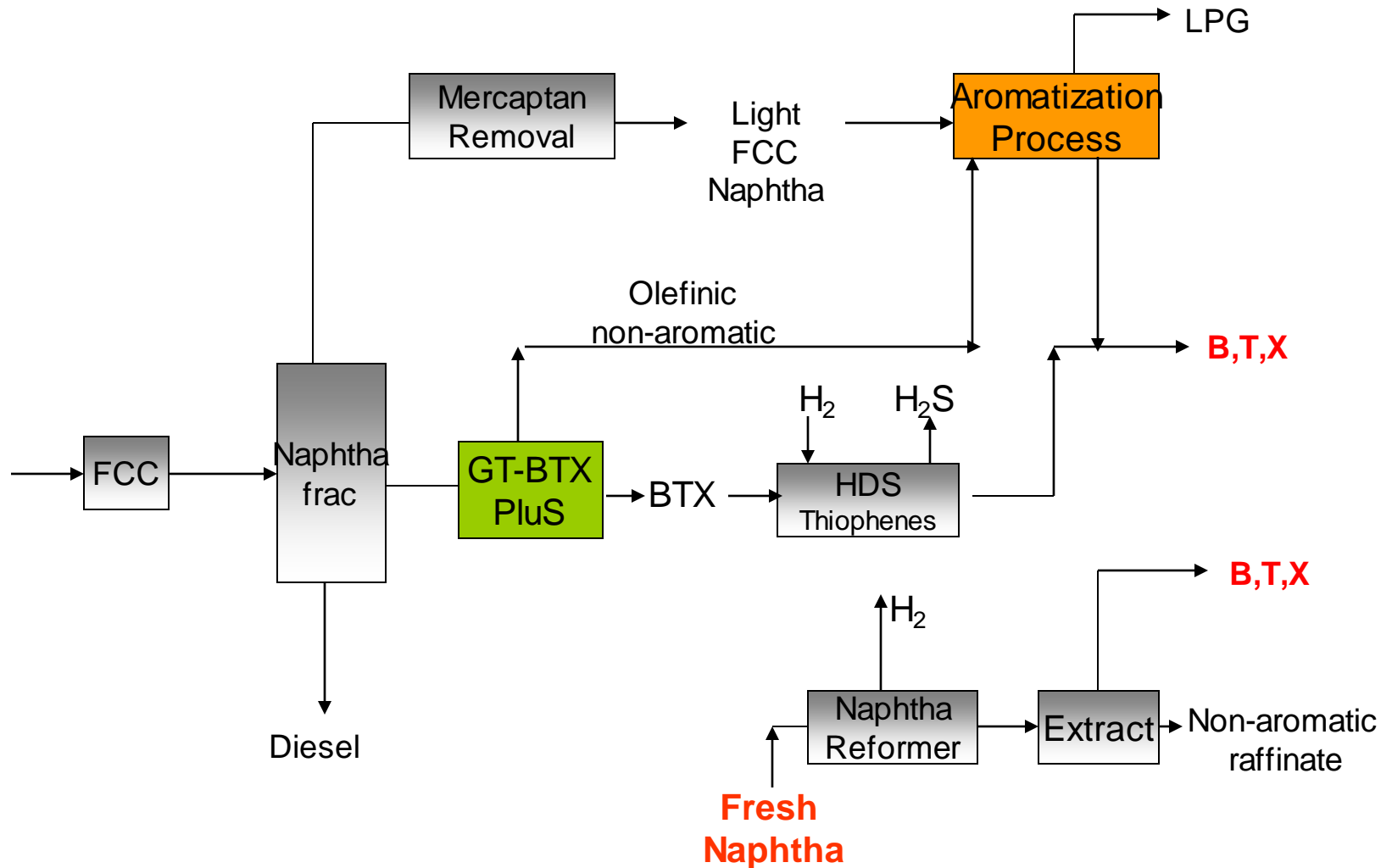
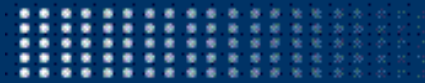


Commercial Aromatization Process Unit





GT-BTX Plus with Aromatization





Example Refinery Aromatization Unit

55,000 BPSD FCC cracking a 340-565 VGO feed:

FCC C₅⁺ Naphtha yield = 32,175 BPSD

C₆-C₉ Aromatics = 6,000 BPSD

recovered by GT-BTX Plus.

Total C₄⁺ olefins from FCC = 8,500 BPSD

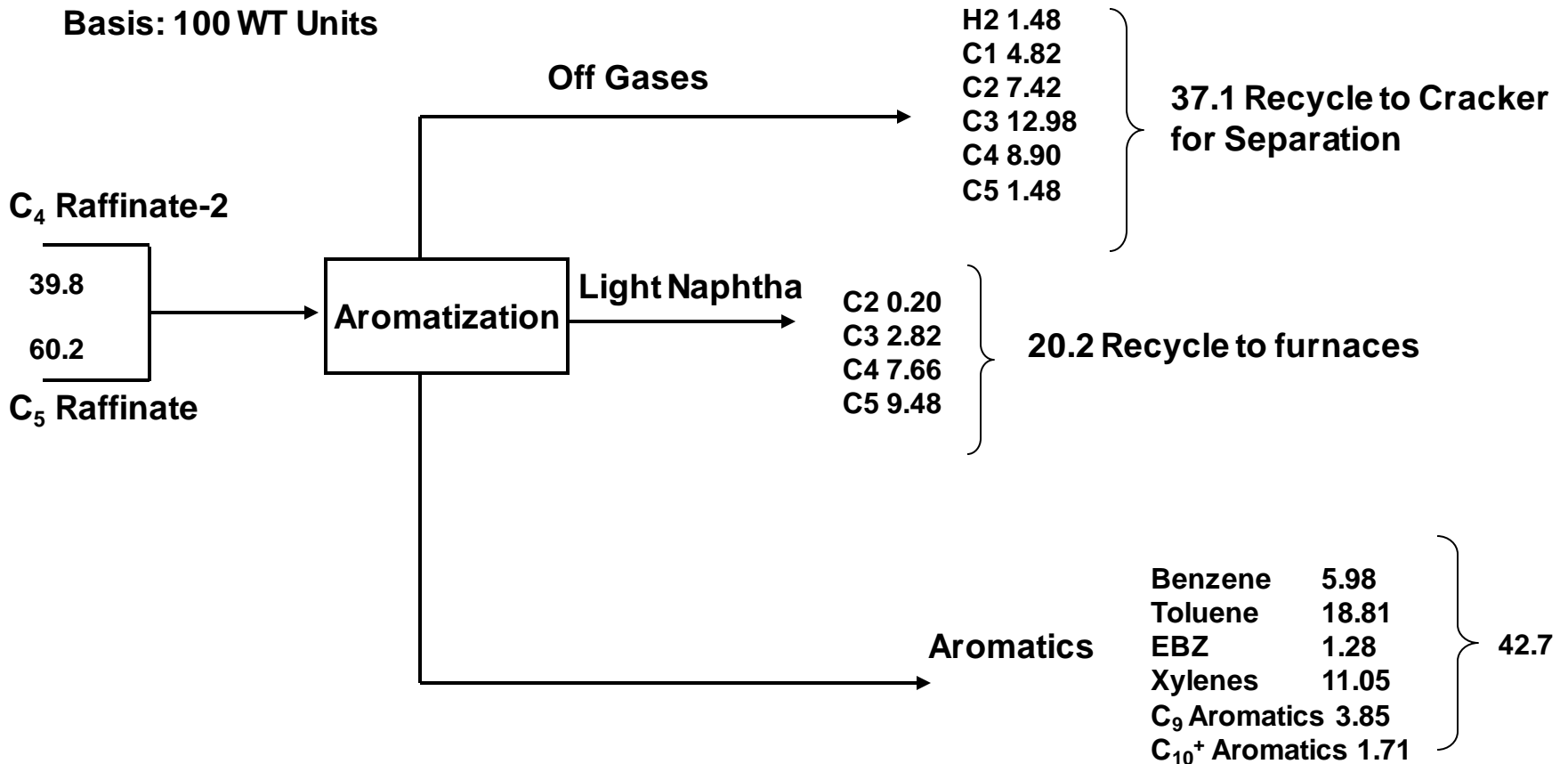
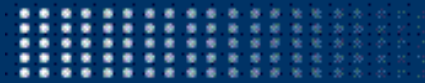
Aromatic generated by Aromatization Process = 8,500 BPSD

Total = 14,500 BPSD

Total Incremental aromatics = 700 KTA



Example Pygas Feed to Aromatization





Aromatization Process Yield

- Product – Approximately same aromatics yield in wt% as olefins plus naphthenes charged.
 - Predominantly Toluene and Xylenes.
 - Also Benzene and C₉ aromatics.
 - Naphthenes are also converted to aromatics



Conclusions

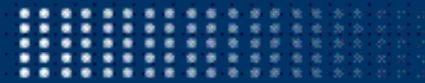
- GTC Technology has processes available now that can significantly improve aromatic feedstock availability, while maintaining current refinery capabilities with increased asset utilization.
- **GT-BTX PluS** for direct aromatics recovery from cracked stock.
- **GT-BTX PluS** with **Aromatization process** for additional aromatics production.



Proprietary Licensed Technologies



Direct Us Your Queries



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