

## CSIR-IIP along with RIL has developed a Technology for the Simultaneous Production of US Grade Gasoline and High Purity Benzene from FCC Naphtha

### About the Technology

- With the increase in Propylene demand FCCU severity is increasing which results in more benzene in FCC gasoline. High benzene in gasoline is restricted below  $<0.62\text{wt}\%$  in the USA. Recovery of high-purity benzene from such gasoline streams will qualify the US-Grade gasoline spec as well as improve the profitability of refineries by providing high-purity benzene
- CSIR-IIP benzene recovery process is a highly energy efficient extractive distillation-based process for simultaneous production of US-Grade Gasoline (Benzene content  $<0.4\text{ wt}\%$ ) and high purity benzene ( $>97\text{ wt}\%$ ) from Fluid Catalytic Cracker (FCC)  $\text{C}_6$  rich Heart Cut Naphtha

### Salient Features of The Technology

- First-of-its-kind technology in the world
- Fully indigenous technology
- Low CAPEX and OPEX compared to other existing technologies worldwide for benzene/aromatics recovery
- Solvent system is highly stable (thermally and chemically)
- Can process impurity-laden feedstock without the requirement of any pre-processing step like SHU

### Accolades for the Technology

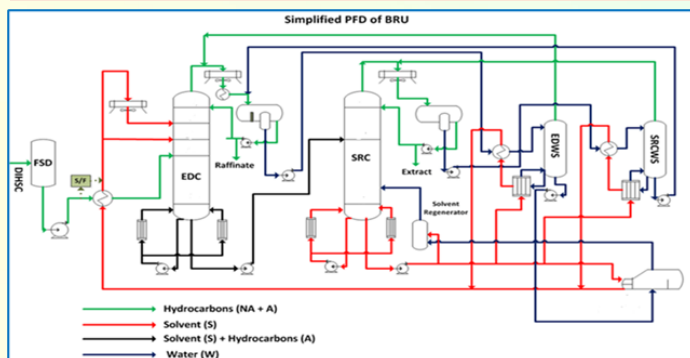
- 7 International Patents and 4 National Award from TDB, DST GOI, ICC, CHT/MoPNG & CSIR for Innovation



Plant commissioning in RIL Jamnagar

### Commercialization of Technology at RIL

- ~0.6 MMTPA plant successfully commissioned in RIL Jamnagar in May 2016 under J3 Expansion Project
- Total expenditure incurred till commercialization: ~Rs. 300 Crores INR with a payback ~1 Year
- India is a net exporter of Benzene (1.92 MMT in 2021-22). Benzene produced using this technology at RIL (~0.12 MMTPA) is ~6% of Benzene export.



Simplified process flow diagram

### Benefits of The Technology

- Direct Employment: ~30 Lakh Man Hours and Indirect Employment: ~12 Lakh Man Hours
- Mobile Sources Air Toxics (MSAT) emission can be reduced by ~25% vol. with the use of benzene lean gasoline results in lower health treatment cost
- Commercialization of this technology will help to increase the profitability of refineries

### Future Commercialization Potential

- Technology is the need of the hour, for efficient recovery of high-value benzene from olefinic FCC heart-cut Naphtha
- It can be used for recovery of benzene from Raw Py-Gas w/o the requirement of any pre-hydrotreatment step for removal of di-olefins
- Can be extended for processing Waste Plastic / reformed Bio derived naphtha

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