Retrofit of Refinery Hydrogen Network Integrated with Light Hydrocarbons Recovery

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Abstract

The processing ratio of inferior and heavy oil has been increasing. With the much more stringent environmental regulations, hydrogenation process in the modern refinery has been more widely used. Hydrogen as necessary utility in the modern refinery, accounted for a very high ratio in the cost of refining. How to optimal design or retrofit of the refinery hydrogen network is one of the important problems faced by modern refineries. The refinery off-gas streams are typical hydrogen-rich gas streams and they are important hydrogen sources. In addition, certain refinery off-gas streams are rich in light hydrocarbons, which are highly valuable raw materials for downstream chemical processes, such as ethylene cracking. Worthy to mention, once the light hydrocarbons in the refinery off-gas streams are recovered, the hydrogen in the remaining gas stream is enriched as new hydrogen source with higher hydrogen purity. Thus, the design or retrofit of refinery hydrogen network integrated with light hydrocarbon recovery offers much more possibilities.