

Strategic Routes to Light Olefins and Chemicals from Refining Streams

Khalid Al-Majnouni (Speaker)

Naif Al-Daalan, Nabil Al-Yassir, Ahmed Al-Zenaidi, Wojciech Supronowicz (Co-Authors) 1.

Institute: Olefins, Industrial Gases & Aromatics, SABIC Technology and Innovation, Saudi Basic Industries Corporation (SABIC), Riyadh 11551, Saudi Arabia.

Light olefins and aromatics such as ethylene, propylene benzene and p-xylene are considered the backbone of petrochemical industry due to their extensive use as chemical building blocks. They are the raw materials employed in the production of vast array of many end products, such as polymer (e.g., polyethylene and polypropylene), oxygenates, and other chemical intermediates.

The world demand of chemicals is around 557 MM ton per year, of which ethylene and propylene account for 48% and aromatics account for 31%. Steam cracking and fluid catalytic cracking are the most widely used technologies for producing these chemicals.

The demand will increase over the next four years at an average growth rate of 3.8 % and 4.5 % for ethylene and propylene respectively. Additional 65 billion lbs of ethylene and 52 billion lbs of propylene need to be added by 2020. To cope with the gap between supply and demand, especially for propylene, two challenges are to overcome; the availability of feedstocks and of the technologies to convert them.

The presentation will address the utilization of refinery streams such as light naphtha to produce light olefins and chemicals, particularly propylene. New catalytic process, instead of widely used thermal cracking, is explored to selectively enhance the propylene yield. In addition, a new proprietary zeolite based catalysts have been developed, aimed at increasing the selectivity to light olefins while maintaining better on-stream and long-term stability. A comparison between the new catalytic process and the conventional steam cracking process will be shared.
