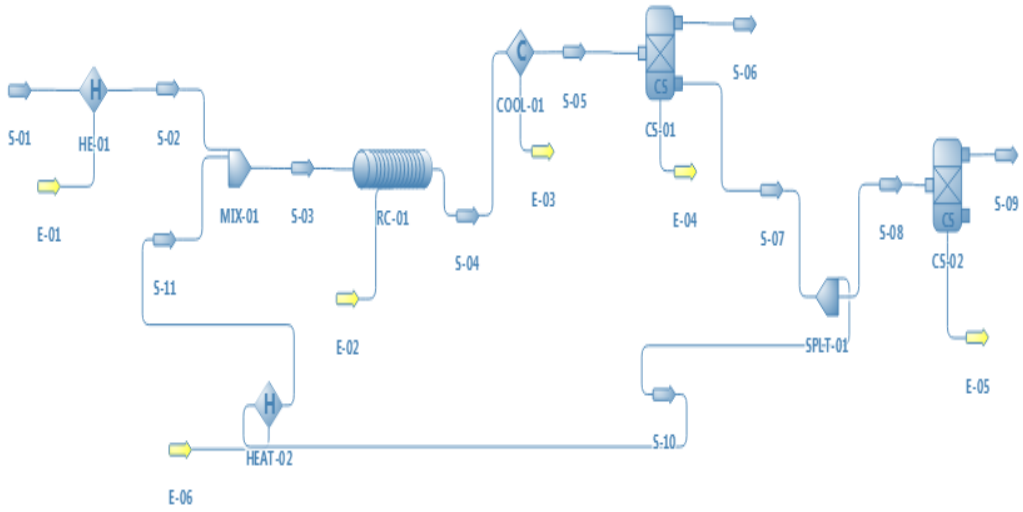
Production of iso-butene from iso-butane

Siddharth Tiwari, Sufiyan Ahmed

MS RAMAIAH INSTITUTE OF TECHNOLOGY - Bengaluru



Background & Description:

The process flowsheet described is the production of isobutene from isobutane by catalytic dehydrogenation. The inlet feed stream is pure isobutane which enters at 35 °C and at a pressure of 4 bar. This stream S-01 enters HEAT-01 where it is heated to a temperature of 550 °C. The stream S-02 enters MIX-01 where it combines with the recycle stream S-11. S-03 then enters RC-01(PFR), after exiting the reactor the stream S-04 enters COOL-01 where it is cooled down to from 550 °C to 90 °C. The stream leaving the cooler S-05 enters the compound separator CS-01 where the top stream S-06 is separated and the bottom stream stream S-07 is sent to SPLIT-01. The stream S-10 leaving SPLIT-01 is pure isobutane which is recycled back and combines with the inlet feed to ensure higher conversion of isobutane to isobutene. Stream S-08 leaving SPLIT-01 enters the compound separator CS-02 where the top stream obtained S-06 is pure isobutene which is the desired product.

RESULTS

Object	S-09	S-01
Temperature (˚C)	90	35
Pressure (bar)	2	4
Mass Flow (Kg/hr)	3600	5812.22
Molar Flow (Kmol/hr)	64.163	100