

Isobutylene Production from Normal Butenes

ISOMPLUS®

Technology Profile

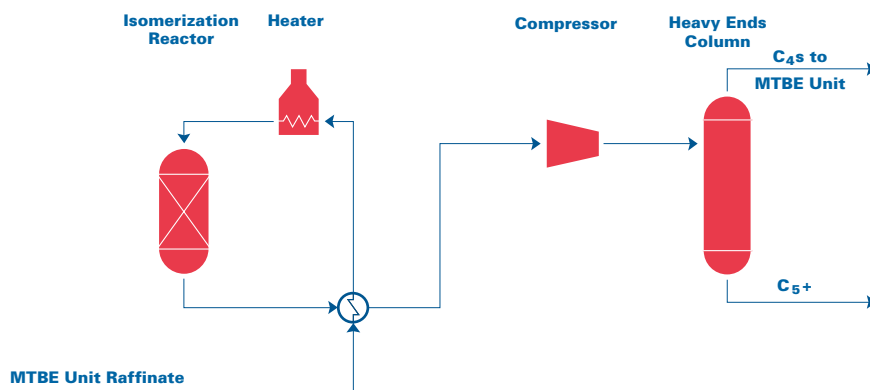
Overview The ISOMPLUS® skeletal isomerization technology processes C_4 streams from refinery or petrochemical units to produce isobutylene. The ISOMPLUS process is jointly developed and commercialized by Catalytic Distillation Technologies (CDTECH®) and Lyondell for license to the petroleum refining and petrochemical industries. CDTECH is a partnership between Lummus Technology, a CB&I company, and Chemical Research & Licensing, a CRI company.

C_4 Olefin Skeletal Isomerization-General Isobutylene is produced by the catalytic skeletal isomerization of normal butenes. A zeolite-based catalyst especially developed for this service provides near equilibrium conversion of normal butenes to isobutylene at high selectivity and long process cycle times. A simple process scheme and moderate process conditions result in low capital and operating costs.

Hydrocarbon feed containing normal butenes, such as MTBE unit raffinate, is vaporized and superheated prior to entering the skeletal isomerization reactor. The hydrocarbon feed does not require steam or other diluents, nor the addition of catalyst activation agents to promote the reaction. The vapor stream passes through the fixed bed reactor where up to 44% of the contained normal butenes are converted at greater than 86% selectivity to isobutylene. The reactor effluent is cooled and compressed to a heavy ends column where C_5+ is separated by fractionation.

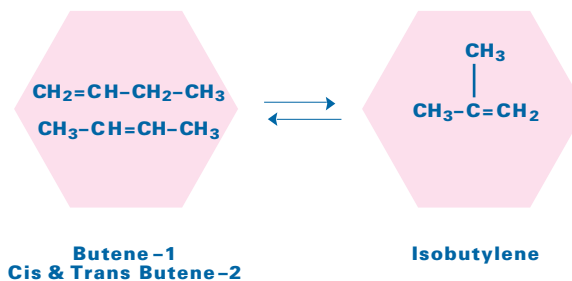
During the process cycle, coke gradually accumulates on the catalyst, reducing the isomerization activity. At the end of the process cycle, the feed is switched to a fresh catalyst bed. The spent catalyst bed is regenerated by oxidizing the coke with an air/nitrogen mixture.

The butene isomerate is suitable for feed to an MTBE unit. When an ISOMPLUS unit is incorporated with a high conversion MTBE unit, production of MTBE can be significantly increased.

ISOMPLUS Process Flow Diagram

Process Chemistry

Skeletal Isomerization



Typical Overall Material Balance

Feeds	LB/HR
Normal Butenes	49,999
Isobutylene	128
Butanes	15,187
Products	
C ₃ -	489
Normal Butenes	28,115
Isobutylene	19,032
Butanes	15,187
C ₅ +	2,491

Advantages

ISOMPLUS offers:

- Near equilibrium conversion
- High selectivity
- Long cycle length
- Simple process
- Low capital cost
- Low operating cost
- No process diluents
- No need for catalyst promoter
- No waste streams
- Increased MTBE potential

CDTECH

3010 Briarpark Drive
Houston, TX 77042 USA
Tel: 713-821-5181
Fax: 713-821-3587