Olefins Production
Methanol To Propylene

Gholam Reza Mardani

Engineering Institute Of Jahadekeshavarzi, Tehran, Iran;
Email:Mardani@jercen.com

Abstract

Olefins (ethylene and propylene) are the main building stones for plastics. They can be produced using several processes and feedstocks. For most processes, ethylene is the main output product, followed at a distance by propylene. There are five major processes for producing of olefins; Steam cracking; Olefins recovery from FCC off gasses; Oxidative coupling of natural gas; Biomass (flash) pyrolysis and finally Methanol to olefin(MTO). During the last decade, the demand for propylene has grown rapidly, as an effect of the growing demand for polypropylene. There are several processes for production of olefins via the methanol to olefins (MTO) such as Uop/Hydro, Lurgi and Exxon Mobil. The growing availability of natural gas has led to advances in technologies designed to capitalize on this low cost resources. With Lurgi Mega-Methanol and MTP technology, Lurgi Oel Gas Chemie commands the processes for a complete chain to obtain from natural gas a product with a high value added. Lurgi's Mega-Methanol technology allows the cost-effective production of methanol and the MTP process ensures the conversion of this product into high-grade propylene.

Key words: MTO, Mega-Methanol, MTP

INTRODUCTION

Currently steam cracking is the process mostly used to produce olefins. For steamcraking the ratio between propylene and ethylene yields is virtually fixed for each feedstock. Therefore the growing demand for propylene asks for another process that delivers mainly propylene: fluid catalytic cracking (FCC). About 88% of propylene is produced by steam cracking; the remainder (12%) originates from FCC. The share of a third process to produce propylene, dehydration of propane, is expected to remain very limited during the next decades. In the future, other processes, which are presently under development, may become commercial. Investigated in this study are the oxidative coupling of natural gas, the methanol-to-olefins (MTO) process and the pyrolysis of biomass. In this study the MTO and specially MTP technology is described in details. Depth description of other technologies are readily available in the literature[1].

METHANOL TO OLEFINS (MTO)

The MTO process runs via catalytic dehydration of methanol. The reaction at temperatures between 350 and 500 ^{o}C and a variety of catalysts can be used. Experiments show that the product composition of the process is highly dependent on the catalyst used. Most MTO processes are designed to maximize ethylene yield. It is, however, possible to reach very high propylene yields instead.