

# INTRODUCTION

Xylenes and ethyl benzenes are C<sub>8</sub> benzene homologues with the molecular formula C<sub>8</sub> H<sub>10</sub>. The three-xylene isomers are ortho-xylene (o-xylene), meta-xylene (m-xylene) and para-xylene (p-xylene), which differ in the positions of the two-methyl groups on the benzene ring. The term mixed xylenes describes a mixture of ethyl benzene and the three xylenes isomers. Mixed xylenes are largely derived from petroleum.

Ethyl benzene is always present, except in the small amount of xylenes produced by toluene disproportionation. Ethyl benzene is diluents, which can accumulate in the recycle processing schemes, and hence has a strong impact on the separation of the individual xylene isomers.

The demand for gasoline far surpasses that for petrochemicals. Gasoline contains ca 24% aromatic material. Thus, the demand for mixed xylenes for petrochemicals use is strongly influenced by the demand for gasoline. By-product credits have a decisive impact on the production economics of the individual isomers.

Xylene serve as an indicator of the nation's petrochemical prowess since its close link to petrochemical production ensures that its supply is intertwined with the production of other chemicals. However, it is not as important as many other products of the chemical industry. Therefore, the main problems faced by market analysts looking at the xylenes business are projecting the future growth in this field. Virgin xylenes are available in plenty and are in most cases directly processed to give pure forms of the isomers. However, the xylene separations are complicated by the fact that the physical and the chemical properties of the

isomers are similar. This necessitates the use of other expensive procedures and the use of distillation columns to achieve high purity. The virgin xylenes are naturally occurring compounds and are separated in the petrochemical refinery. The C<sub>8</sub> aromatic cut is sent through many processing stages to finally obtain individual isomers of high purity. The Indian scenario for xylenes reveals an expanding market, with the leading petrochemical companies like reliance industries and IPLC running xylene separation plants.

Production of p- xylene and o- xylene is mainly a separation of the above isomers from a C<sub>8</sub> cut from various sources of virgin xylene, i.e. petroleum sources, which includes catalytic reformat or pyrolysis gasoline and a minor chunk as a coke oven by-product. The other source is toluene disproportionation. Toluene disproportionation is defined as the process in which two moles of toluene are converted to one mole of benzene and one mole of xylenes (the ratio however can be altered). Xylenes obtained by this method are more expensive than by the conventional routes but have significant feedstock advantages when recovering p-and p- xylene isomers.