

Production of xylenes

INTRODUCTION

Xylenes and ethylbenzene are C_8 homologues with the molecular formula C_8H_{10} . The three xylene isomers are o-xylene, m-xylene and p-xylene, which differ in the positions of two methyl groups on the ring. The term mixed xylenes describes a mixture of ethylbenzene and the three xylene isomers. Mixed xylenes are derived largely from petroleum.

While xylene aren't as important as many other products of the chemical industry they certainly serve as an indicator of the nations' petrochemical prowess. Xylene production's close link to petrochemical production ensures that its supply is intertwined with the production of other chemicals. Ethylbenzene, an isomer of the xylenes, is always present in small amounts and can influence the economics, of the process as being a diluent it accumulates in the recycle and hence has to be periodically removed. Xylene separations are complicated by the fact that the physical and chemical properties of all the isomers are similar. This necessitates the use of other expensive procedures and the use of large distillation columns to achieve high purity.

Virgin xylenes are in most cases directly processes to give pure forms of the isomers. These xylenes are naturally occurring compounds and are separated in the petrochemical refinery. The Ca 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 leading petrochemical companies, like Reliance Industries and IPCL running xylene separation plants.

Xylenes find various uses in the industry. Meta-xylene is further reacted and processed to give isophthalic acid, which finds its final uses in polyester resins and alkyd resins. Ethylbenzene is directly used for the production of styrene which finds final uses in SBR, polystyrene plastics, S-B co polymers, styrene-Divinylbenzene copolymers, styrene-alkyd polyesters and styrene-acrylonitrile plastics. Para-xylene is used in the production of terephthalic acid and Dimethyl terephthalate, which find their ultimate use in polyester resins, polyester fibers and polyester films. Ortho-xylene is used in the manufacture of phthalic anhydride, which is used in producing plasticizers, alkyd resins and polyester resins. A mixture of para, meta and ortho-xylenes is used in the production of isophthalic acid and terephthalic acid. Given the diverse uses of xylenes, and their special importance in the polymer industry, their importance can hardly be over-exaggerated. Of all the xylenes para and ortho-xylene are the commercially the most important xylenes and together account for nearly 80% of the total output: o-xylene is a less expensive starting material for phthalic anhydride and also affords a higher yield potential. M-xylene, whose consumption is quite small, is used in producing primarily isophthalic acid.