

Production of 250 TPD of Benzene

INTRODUCTION

Benzene, C_6H_6 , is a volatile, colorless, flammable liquid aromatic hydrocarbon which possesses a characteristic odour. It is used primarily as a chemical raw material in the synthesis of styrene, phenol, cyclohexane, aniline, maleic anhydride, alkyl benzenes, chlorobenzenes, and other products used in the production of drugs, dyes, insecticides & plastics. Benzene, along with other light, high octane aromatic hydrocarbons, such as toluene and xylenes, is a component of motor gasoline. Benzene is also used as a solvent but it has been replaced by safer solvents in most applications.

An aromatic fraction containing benzene was known in the eighteenth century as a product of the distillation of coal. Benzene, or bicarburet of hydrogen as it was then called, was first isolated in 1825 by Faraday, who obtained it from a liquid condensed by compressing oil gas. In 1833, Mitscherlich obtained bicarburet of hydrogen by distilling benzoic acid with lime and suggested the name benzine for the compound. In 1845, benzene was found by A.W Hoffman in light oil derived from coal tar.

Benzene was first extracted from coal gas by oil scrubbing in the 1860's by Badische Company in Germany. It is probably the most thoroughly studied and best known of all organic compounds. One of the first important early uses of benzene was to manufacture phenol (for antiseptic properties) by reaction with sulfonic acid to form benzene sulfuric acid, which was fused with caustic soda to form phenol. By the 1930's, about 1.5 million tons of benzene was recovered worldwide from coal gas. World War II upset the traditional supply/demand balance and created a need to recover benzene from petroleum. Petroleum sources now provide 97 percent of the benzene. Benzene is produced from five main sources (i.e., catalytic reforming of naphtha, dealkylation of toluene, recovery from ethylene plant pyrolysis gasoline, coke oven and selective toluene disproportionation). Other new technologies such as Aromax[®] and Cyclar[®] are expected to be utilized more in the future because of low cost feedstocks (i.e. C6 - C7 and C3-C4 paraffins)