POLLUTION CONTROL AND SAFETY

HEALTH AND SAFETY FACTORS

The Xylene isomers are designated as flammable liquids and as such should be stored in approved closed containers with a red level out of those and away from heat or open flames. Limits for transportation by air are one liter (passenger planes and 40 liter (cargo planes).

The upper and lower flammability limits are 1% and 7%. The field detection limit is 10 ppm and the laboratory detection limit is 0.003 ppm. The odor threshold limits (lower, medium and upper) are 0.26, 2.21, 4.13 ppm respectively.

The xylenes are not very toxic. They are mild skin irritants and the canister typeface masks are recommended. The oral LD_{50} value for rats is 4000 pip. Prolonged exposure to human beings should be restricted to 200 ppm. Xylenes show mild toxicity only to fish, and the threshold limit for crop damage is 800-2400 ppm. Biodegradation with activated seed is slow and sewage digestion is impaired by 0.1% conc. In the event of a spill, oil skimming equipment, adsorbent form and charcoal may be used for cleanup.

POLLUTION PREVENTION

The sources of wastes are classified as follows

(1) Losses of oil (and hydrocarbons in general) :

Such losses are caused mainly by entrainment, emulsification and to lesser extent, dissolution of hydrocarbons in an aqueous phase in all operations involving contact between hydrocarbons and water and by inadvertent leakage from equipment and piping.

(2) Irreducible wastes generated as a separation of unwanted impurities in the processing. The impurities which originally comes with crude oil are often created during refining are converted to useful and commercially viable products such as ammonia, sulphur, phenolics and metals.

The commonly encountered wastes are

(1) Oily sledges

(2) Spent caustics

(3) Spent catalysts

(4) Miscellaneous process wastes

(5) Waste water

OILY SLUDGES

Oily sludges are stable emulsions formed through emulsification of oil with water usually in the presence of suspended fines.

Raw watery sludges are filtered using pressure belt filter press or are centrifuged to remove solids which destabilize the emulsion, causing it to separate into three phases: oil, water and dewatered sludges. The dewatered sludge can be further treated to recover the oil using either solvent extraction technique or thermal processing. Often off- site disposal is more economical, especially if sludge volumes are small.

SPENT CAUSTICS

Solutions of NaOH are used primarily to wash the hydrocarbon products or intermediates in order to remove the dissolved sulphides , mercaptans ,phenolics and other acidic compounds. The phenolic and sulphitic spent caustics should be segregated in order to enable recycling.

SPENT CATALYSTS

With time, catalysts generally lose their activity through sintering, poisoning or buildup of surface deposits. The generation of more stable and/or regenerable catalysts is the leading pollution control measure.

WASTE WATER

Wastewater is generated due to mainly the following streams:

(1) Cooling water blowdown

(2) Process water