Montreal Protocol

Process Agents Task Force

Case Study #20

Use of CTC in manufacture of diclofenac sodium

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The manufacture of diclofenac sodium involves the following steps:

1. Phenol is reacted with chlorine gas after being dissolved in CTC and perchloroethylene to produce 2, 6 Dichlorophenol (2, 6 DCP). This product when produced by this way gives high purity and better selectivity for the chlorination to take place as desired instead of other reaction products.

2. 2, 6 DCP is then reacted with Aniline to make 2, 6 Dichlorodiphenyl Amine.

3. Next 2, 6 Dichlorodiphenyl amine is converted to N chloroacetyl 2, 6 dichloro diphenyl amine.

4. This product is converted with aluminium chloride to 1- (2, 6 dichlorodiphenyl Endolinone) which is turn is conevrted to diclofenac sodium.

Thus from the above reaction steps, it is clear that the base chemical where CTC is used as a process agent is 2, 6 dichloro phenol which is and can be produced by several other chemical producers and has other applications in the dyestuff and pharmaceutical industry as well.

There may be several factories producing this chemical in India. As well, some enterprises in India that make diclofenac sodium import this item as a base material from China and then conduct the reaction. It is therefore possible that production facilities in China may also use CTC.
INDIAN DICLOFENAC SODIUM PROCESS

Phenol → Chlorine (Cl₂) → CTC & PCE → 2,6 Dichloro Phenol

2,6 Dichloro Phenol + Aniline → 2,6 Dichlorodiphenyl Amine

1-(2,6 Dichlorodiphenyl Indolinane) → AlCl₃ → N Chloroacetyl 2,6 Dichlorodiphenyl Amine

N Chloroacetyl 2,6 Dichlorodiphenyl Amine + CoNa → Diclofenac Sodium