

Montreal Protocol



Process Agents Task Force

Case Study #20

Use of CTC in manufacture of diclofenac sodium

May 2001

Notice

The United Nations Environment Program (UNEP), the UNEP Process Agents Task Force chairs and members and the companies and organisations that employ UNEP Process Agents Task Force chairs and members do not endorse the performance, worker safety, or environmental acceptability of any of the technical options discussed. Every industrial operation requires consideration of worker safety and proper disposal of contaminants and waste products. Moreover, as work continues -- including additional toxicity testing and evaluation -- more information on health, environmental and safety effects of alternatives and replacements will become available for use in selecting among the options discussed in this document.

UNEP and the UNEP Process Agents Task Force chairs and members, in furnishing or distributing this information, do not make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or utility; nor does UNEP or members and chairs of the UNEP Process Agents Task Force assume liability of any kind whatsoever resulting from the use, reliance upon, any information, material, or procedure contained herein, including but not limited to any claims regarding health, safety, environmental effects or fate, efficacy, or performance, made by the source of information.

Mention of any company, association, or product in this document is for information purposes only and does not constitute a recommendation of any such company, association, or product, either express or implied by UNEP, the UNEP Process Agents Task Force chairs or members and the companies or organisations that employ the UNEP Process Agents Task Force chairs and members.

**This Report of the
Process Agents Task Force
is available on the Internet
in Portable Document Format (PDF)
at:
<http://www.teap.org>**

CS-20 Use of CTC in manufacture of diclofenac sodium

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 then converted 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

