



Toxics Link  
for a toxics-free world

# HEXACHLOROBENZENE (HCB)

## A PERSISTENT ORGANIC POLLUTANT

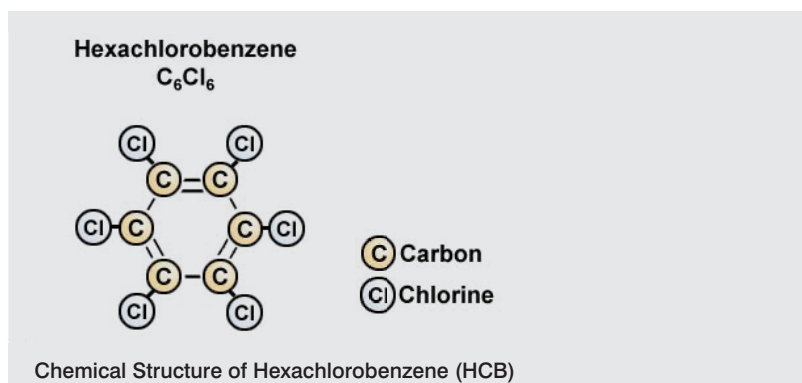
### Introductory Facts

**H**exachlorobenzene (HCB) or Perchlorobenzene is a chlorinated aromatic hydrocarbon compound. The commercial production of HCB started in 1933 as a fungicide for the treatment of seeds especially to control wheat against bunt. Subsequently, HCB was used as an intermediary/catalyst for the manufacture of industrial chemicals like synthetic rubber, dyes, fireworks and ammunition.

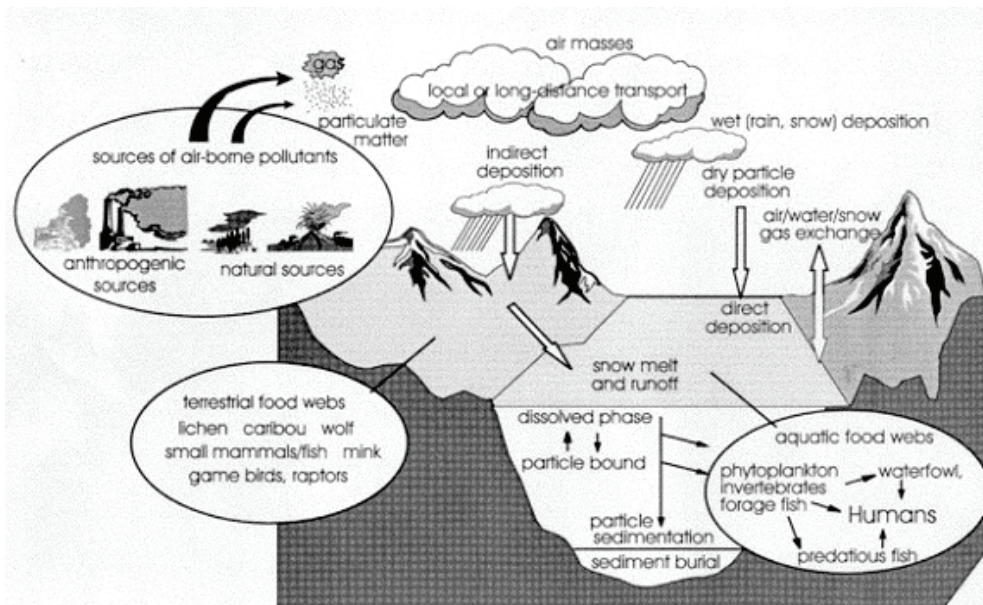
HCB is also released unintentionally during the manufacture of certain industrial chemicals like tetrachloroethylene, trichloroethylene carbon tetrachloride and exists as an impurity in several pesticide formulations. HCB is also released during the combustion of coal, waste incineration and certain metal processes. Recognizing the adverse health and environmental impacts of HCB, many countries across the globe have banned and restricted its use.

### HEALTH AND ENVIRONMENTAL IMPACT OF HCB

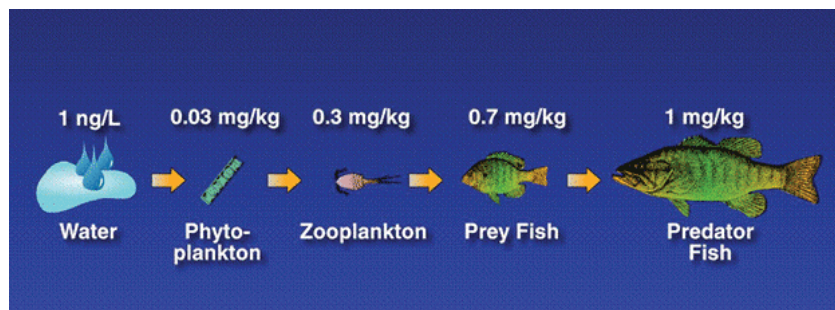
The World Health Organization (WHO) has categorized Hexachlorobenzene as an “extremely hazardous” substances. Hexachlorobenzene has been listed as Group-2 carcinogens by the IARC (International Agency for Research on Cancer). Studies have found that, the animals which consumed Hexachlorobenzene for months or years, developed cancer of



**FIGURE 1 - Sources of HCB**



**FIGURE 2 – HCB Biomagnification**



the liver, kidney, and thyroid. Chronic exposure can cause permanent skin changes, such as change in the pigment and skin thickening. It can also damage bones, blood, immune & nerve systems. HCB enters human body through contaminated food & water and also through inhalation & skin, it then rapidly spreads through the blood to various tissues and deposits in the fat. A large portion of Hexachlorobenzene in the fat of a mother can be transferred to her baby through breast milk.

In a significant incident, in Anatolia, Turkey 500 people were fatally poisoned and more than 4,000 people fell ill by eating bread made with HCB-treated seed that was intended for agricultural use. Most of the people were affected with Porphyria Cutanea Tarda, which disturbs the metabolism of hemoglobin and results in skin lesions. Almost all breastfeeding children under the age of two, whose mothers had consumed contaminated bread, died from a condition called “Pembe Yara” or “pink sore,” most likely from high doses of HCB in breast milk. This fatal incident forced the policy makers across the world to rethink about the use of HCB as a pesticide.

Half-life of HCB in soil is upto 7.5 years. Hexachlorobenzene has been detected in various samples around the world, and has been recognized as a global pollutant. Hexachlorobenzene tends to remain in the environment for a long time and is a highly persistent compound, even in less concentration these are toxic to birds, fish, and animals. Hexachlorobenzene gets easily adsorbed in the soil. It is slightly soluble in water and thus most of it remains as particles in the river bed and on the bottom of the lakes. High levels of HCB can gradually accumulate in fish, marine mammals,

birds and animals as they depend on lichens and fish for their food.

## **HCB AS POPs IN THE STOCKHOLM CONVENTION**

Hexachlorobenzene belongs to the category of Persistent Organic Pollutants (POPs) and has been listed in the initial dirty dozen list in the Stockholm Convention. HCB has been listed both in Annexure A that requires parties to take measures to eliminate the production and use of HCB and Annexure C, which requires the parties to take measures to reduce unintentional release of HCB.

However, the parties can get specific exemptions under Annexure A, if they register for that exemption. As per note (iii) of Part I of Annex A, hexachlorobenzene can be used/ produced as a closed-system site-limited intermediate that is chemically transformed in the manufacture of other chemicals that, taking into consideration the criteria in paragraph 1 of Annex D, do not exhibit the characteristics of persistent organic pollutants. Such production and use shall cease after a ten-year period, unless the Party concerned submits a new notification to the Secretariat, in which case the period will be extended for an additional ten years unless the Conference of the Parties, after a review of the production and use decides otherwise.

## **INTERNATIONAL SCENARIO OF HCB**

### **HCB IN STOCKHOLM CONVENTION**

- HCB is listed as PoPs in 2006 (Part of dirty dozen).
- HCB has been listed in both Annexure A and C.
- The parties need to take measures to eliminate the production and use of HCB.
- The Parties need to take measures to reduce the unintentional release of HCB.
- The parties can get exemption for closed production of HCB as an intermediary use after informing the Stockholm Convention secretariat.

HCB had many uses in industry and agriculture. The major agricultural application for HCB was as a seed dressing for crops such as wheat, barley, oats and rye to prevent fungal disease. The use of HCB in agricultural application has been discontinued in many countries since the 80s. Worldwide production of HCB as pesticides was estimated to be 10,000 tonnes/year for the period 1978-1981. An estimated of 8,000 tonnes/year of HCB is being produced by the EU.

HCB has been produced as an industrial chemical in many countries including China and India. Approximately, 1,500 tonnes of HCB

was manufactured annually in Germany for the production of rubber auxiliary PCTP, but that production has been discontinued since 1993.

Though the Stockholm Convention discourages production of HCB for industrial use, yet China has got exemption for the production of HCB in a closed system for intermediate use. China produced 3,000,000 - 4,000,000 kg of HCB as an intermediate in the production of Na-PCP. The present exemption will be valid till 1 February, 2015.

## COUNTRIES' POSITION ON HCB ACROSS THE GLOBE

Countries	As pesticides	As Industrial Chemicals	As Unintentional PoPs
USA	Banned in 1965	Banned in USA	No specific information
EU	Most EU countries banned in 60s	Banned long time back	Inventory in NIP
JAPAN	Never registered/ Prohibited Under Chemical Regulations	Prohibited	Inventory in NIP
Indonesia	Registered/Ban came into force after the Stockholm Convention	Never registered as industrial chemical	Inventory and Plan of action in NIP
China	Prohibit the production and use from 2008.	Got exemption to produce as intermediate in the production of Na-PCP	No action plan in NIP
Sri Lanka	No Clarity	Never registered	Inventory and plan of action in NIP
India	Never Registered as Pesticides (NIP)	Listed as hazardous chemicals	No inventory and no clear action plan in NIP

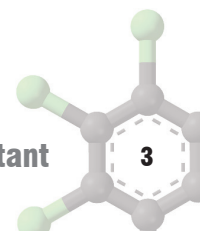
## India's Position on Hexachlorbenzene

### HCB USED AS PESTICIDE:

HCB was used as an important pesticide across the world. However, as per the Ministry of Chemicals and Fertiliser, Government of India, HCB is not registered as a pesticide in India. Incidentally, a report prepared by the Information and Credit Rating Agency limited on "The Indian Pesticides Industry", HCB represented 30% of the total pesticide consumption of the country.

### HCB AS AN INDUSTRIAL CHEMICAL

HCB has a limited use as an industrial chemical. In the Stockholm Convention, exemption has been allowed for HCB as an industrial chemical but with the rider and subject to fulfilment of certain conditions. Thus, HCB can be produced or can be used in a closed system as an intermediary for the products that should not exhibit PoPs characteristics. HCB while being produced as an intermediary should not be exposed in the environment. The produce



countries intending to produce HCB will require to apply to UNEP and seek exemption to do so. As of now India has not opted for exemption for the production of HCB as an industrial chemical. The National Implementation Plan (NIP) on POPs, prepared by the Ministry of Environment and Forests has stated that “GOI is in the process of banning HCB as the industrial chemicals”.

A report prepared by UNEP in Open-ended Working Group of the Basel Convention on Control of Transboundary Movements of Hazardous Wastes and their Disposal, has stated that India produced 42,612 ton of technical grade HCB during 1995-97. And the report

has referred the Ministry of Chemicals and Fertiliser, Government of India as the source of information.

## UNINTENTIONAL RELEASE OF HCB

HCB is also released unintentionally through anthropogenic and non anthropogenic process. In the Stockholm Convention, HCB has been placed in Annexure –C, that puts obligation on the parties to take adequate measures to reduce the unintentional release of chemicals. India has no data on the unintentional release of HCB till now and no action plan has been mooted to minimize the unintentional release of this chemical.

### FACTS ABOUT HCB

- HCB has been included in the original dirty dozen list of chemicals in the Stockholm Convention and has been included in both Annexure A and C.
- HCB has been banned as a pesticide however exemption being allowed as industrial chemical, subject to fulfillment of certain conditions.
- China has applied for an exemption for the industrial use and is being exempted for 10 years.
- India submitted the National Implementation Plan in 2011.
- In NIP it has been mentioned that HCB is not registered as a pesticide in India and soon will be banned as an industrial chemical.
- The Ministry of Chemicals has revealed that no production data is available on HCB as an industrial chemical with the concerned Ministry.
- According to UNEP, India has not applied for the exemption as an industrial chemical, which implies that India should stop producing HCB.
- The website of the Chemical industries have mentioned about the production of HCB in India.
- In the amended Manufacture, Storage and Import of Hazardous Chemical Rules- 1989, HCB has been placed in the list of Hazardous chemicals.
- There is no plan of action to reduce the unintentional HCB release in India.

#### Compiled and written by:

Piyush Mohapatra | Email: [piyush@toxicslink.org](mailto:piyush@toxicslink.org)

Alka Dubey | Email: [alka@toxicslink.org](mailto:alka@toxicslink.org)

#### For more information, please contact:

##### Toxics Link

H2 (Ground Floor)

Jungpura Extension

New Delhi 110 014

T: +91-(0)11-24328006, 24320711

E: [info@toxicslink.org](mailto:info@toxicslink.org)