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**United Nations
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**Stockholm Convention on Persistent Organic Pollutants
Persistent Organic Pollutants Review Committee
First meeting**

Geneva, 7–11 November 2005

Item 5 (b) of the provisional agenda *

**Consideration of chemicals proposed for inclusion in
Annexes A, B and C of the Convention: chlordecone**

Chlordecone proposal**

Note by the Secretariat

The annex to the present note contains a proposal by the European Union and its member States that are Party to the Stockholm Convention on Persistent Organic Pollutants for listing chlordecone in Annex A of the Stockholm Convention pursuant to paragraph 1 of Article 8 of the Convention. The annex is being circulated as submitted and has not been formally edited by the Secretariat.

* UNEP/POPS/POPRC.1/1.

** Stockholm Convention, Article 8, paragraph 1.

Proposal for listing

Chlordecone

in Annex A of the Stockholm Convention

on Persistent Organic Pollutants

Introduction

Chlordecone is a synthetic organochlorine compound which has mainly been used as an agricultural insecticide. Chlordecone has been identified as a Persistent Organic Pollutant (POP) chemical under the Protocol to the Convention on Long-range Transboundary Air Pollution (CLRTAP) on Persistent Organic Pollutants and the provisions of the Protocol oblige Parties to phase out all production and uses of chlordecone. Chlordecone is chemically very similar to mirex, another pesticide which is already listed in the Stockholm Convention.

This dossier focuses solely on the information required under paragraphs 1 and 2 of Annex D of the Stockholm Convention and it is mainly based on information from the following review reports:

- Environmental Health Criteria (EHC) 43: Chlordecone. IPCS International Programme on Chemical Safety. United Nations Environment Programme. International Labour Organisation. World Health Organization. Geneva 1990 (available at: <http://www.inchem.org/documents/ehc/ehc/ehc43.htm>)
- Toxicological profile for mirex and chlordecone. U.S. Department of Health and Human Services. August 1995 (available at: <http://www.atsdr.cdc.gov/toxprofiles/tp66-p.pdf>).

These extensive review reports also serve as a source of further information referred to in paragraph 3 of Annex D of the Stockholm Convention on this candidate POP chemical.

1 Identification of the chemical

1.1 Names and registry numbers

CAS chemical name: 1,1a,3,3a,4,5,5,5a,5b,6-decachloro-octahydro-1,3,4-metheno-2H-cyclobuta[cd]pentalen-2-one

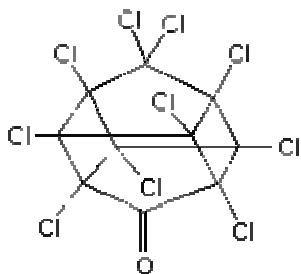
Synonyms: decachloro-pentacyclo[5,2,1,0^{2,6},0^{3,9},O^{5,8}]decan-4-one,
decachloro-octahydro-1,3,4-metheno-2H,5H-cyclobuta[cd]pentalen-2-one

Trade names: GC 1189, Kepone, Merex

CAS registry number: 143-50-0

EC number: 606-019-00-6

1.2 Structure



(Structural Formula source: www.webbook.nist.gov)

Molecular formula: $C_{10}Cl_{10}O$

Relative molecular mass: 490.6

2 Persistence

Chlordecone is highly persistent in the environment. According to the information given in the review reports, the estimated half-life of chlordecone in soil is between 1-2 years. It is not expected to hydrolyze or biodegrade in the environment. Direct photodegradation is not significant. The primary process for the degradation of chlordecone in soil or sediments is anaerobic biodegradation.

3 Bioaccumulation

Based on the lipophilic nature of this compound (high octanol-water partition coefficient), chlordecone has a tendency to both bioaccumulate and biomagnify in aquatic food chains. BCF values of over 60,000 have been measured in Atlantic silversides, an estuarine fish species.

log KOW: 4.50 – 6.00

BCF: > 60 000 (Atlantic silversides)

> 9 000 (Oysters)

16 600 (Fathead minnow)

4 Potential for long-range environmental transport

Vapour pressure of chlordecone is less than 3×10^{-5} mm Hg at 25°C. Chlordecone is not expected to be subject to direct photodegradation in the atmosphere. Its estimated half-life time in air is up to 50 years. Atmospheric transport of chlordecone particles was reported in USA during production years.

5 Adverse effects

Chlordecone is moderately toxic to laboratory mammals with single exposures. Acute toxic symptoms in all species tested included severe tremors. It can cause skin irritation. In long-term studies, lower doses caused tremors and other neurological symptoms and liver hypertrophy.

Chlordecone interferes with reproduction, and it is fetotoxic in experimental animals. It is not generally active in short-term tests for genetic activity. Chlordecone is carcinogenic in both sexes of mice and rats producing hepatocellular carcinomas. International Agency for Research on Cancer (IARC) concludes that there is sufficient evidence that chlordecone is carcinogenic in mice and rats. In the absence of adequate data in humans, it is reasonable to regard chlordecone as if it presented a carcinogenic risk to humans.

The substance is very toxic to aquatic organisms. The few data available on terrestrial ecosystems indicate low acute toxicity but some long-term effects on vertebrate reproduction.

6 Statement of the reasons for concern

Chlordecone is chemically very similar to mirex, an organochlorine pesticide already listed in the Stockholm Convention. According to the available data, chlordecone is very persistent in the environment. It has a great potential for bioaccumulation and in addition there is monitoring evidence of its biomagnification. Due to its physical and chemical properties and considerably long atmospheric half-life and based on findings in environmental samples, it can be assumed that chlordecone can be transported long distances in air, far from its sources. Chlordecone is associated with wide range of harmful effects to both mammals and aquatic organisms.

Production and use of chlordecone has been ceased over the last decades in developed countries but it is assumed still to be produced or used as an agricultural pesticide in some developing countries. As chlordecone can move in the atmosphere far from its sources, single countries or groups of countries alone cannot abate the pollution caused by it. Regional action has already been considered necessary and chlordecone is totally banned under the CLRTAP Protocol on POPs. Due to the harmful POP properties and risks related to its possible continuing production and use, global action is warranted to eliminate this pollution.
