POPRC-7/3: Hexachlorobutadiene

The Persistent Organic Pollutants Review Committee,

Having examined the proposal by the European Union and its member States parties to the Stockholm Convention on Persistent Organic Pollutants to list hexachlorobutadiene (CAS No: 87-68-3) in Annexes A, B and/or C to the Convention and having applied the screening criteria specified in Annex D to the Convention,

1. *Decides,* in accordance with paragraph 4 (a) of Article 8 of the Convention, that it is satisfied that the screening criteria have been fulfilled for hexachlorobutadiene, as set out in the evaluation contained in the annex to the present decision;

2. *Also decides,* in accordance with paragraph 6 of Article 8 of the Convention and paragraph 29 of the annex to decision SC-1/7, to establish an ad hoc working group to review the proposal further and to prepare a draft risk profile in accordance with Annex E to the Convention;

3. *Invites,* in accordance with paragraph 4 (a) of Article 8 of the Convention, parties and observers to submit to the Secretariat the information specified in Annex E before 9 January 2012.

Annex to decision POPRC-7/3

Evaluation of hexachlorobutadiene against the criteria of Annex D

A. Background

1. The primary source of information for the preparation of the present evaluation was the proposal submitted by the European Union and its member States parties to the Convention contained in document UNEP/POPS/POPRC.7/3. Supporting information was provided in document UNEP/POPS/POPRC.7/INF/4.

2 Additional sources of scientific information included a national database on bioaccumulation data and peer-reviewed scientific papers.

B. Evaluation

3. The proposal was evaluated in the light of the requirements of Annex D regarding the identification of the chemical (paragraph 1 (a)) and the screening criteria (paragraphs 1 (b)–(e)):

(a) Chemical identity:

(i) Adequate information was provided in the proposal and supporting documents;

(ii) The chemical structure was provided;

The chemical identity of hexachlorobutadiene is clearly established;

(b) Persistence:

(i) Estimated half-lives in natural waters range from 4 to 52 weeks (greater than two months) and estimated half lives in soil range from 4 to 26 weeks (up to six months);

(ii) Model calculations yield the conclusion that hexachlorobutadiene does not biodegrade quickly. It has been reported in polar bears in Svalbard (Norway) and in invertebrates, fish, birds and mammals in Greenland.

There is sufficient evidence that hexachlorobutadiene meets the criterion on persistence;

(c) Bioaccumulation:

(i) Evidence from *Oncorhynchus mykiss* indicates a bioconcentration factor greater than 5,000 and the log Kow is close to 5 (in the range of 4.78 to 4.9). Evidence from *Cyprinus carpio* indicates that bioconcentration factor is in the range of 6,608 to 7,555 (Ref.1);

(ii) and (iii) Hexachlorobutadiene has been detected in various Arctic biota in Greenland and in plasma and fat of polar bears in the Arctic Svalbard Islands (see (b) (ii) above).

There is sufficient evidence that hexachlorobutadiene meets the criterion on bioaccumulation;

(d) Potential for long-range environmental transport:

(i) and (ii) Hexachlorobutadiene has been detected in different Arctic biota in Greenland and in plasma and fat of polar bears in the Arctic Svalbard Islands (see (b) (ii) above);

(iii) The estimated half-life in air of hexachlorobutadiene is far greater than two days (i.e., from 60 days to 3 years). Model estimates are provided for a transport distance of almost 8,800 km;

There is sufficient evidence that hexachlorobutadiene meets the criterion relating to potential for long-range environmental transport;

(e) Adverse effects:

(i) Not available;

(ii) For mammals, the no observed adverse effect level (NOAEL) in a two-year oral study with rats and a 90-day oral study with mice is 0.2 mg/kg-bw/d (renal toxicity). For aquatic species, acute LC_{50} values vary from 0.0032 mg/L to 4.5 mg/L. A no observed effect concentration (NOEC) of 6.5 µg/L was established in an early life stage (ELS) study. Genotoxicity was examined in a *Salmonella typhimurium* mutagenicity assay (Ames test) and in an *in vitro* chromosome aberration test. In this study, induced chromosome aberrations were demonstrated (Ref. 2). Swain et al. documented kidney injury specific to the proximal tubule of the kidney. Injury to the nephron was characterized at 24 h following a single dose of hexachlorobutadiene, using a range of quantitative urinary measurements, renal histopathology and gene expression (Ref. 3).

There is sufficient evidence that hexachlorobutadiene meets the criterion relating to adverse effects.

C. Conclusion

4. The Committee concluded that hexachlorobutadiene met the screening criteria specified in Annex D.

References

1. National Institute of Technology and Evaluation (NITE) (2009). Biodegradation and Bioconcentration Database of Existing Chemical Substances. http://safe.nite.go.jp/english/kizon/kizon_start_hazkizon.html (accessed on 21 August 2009).

2. Beat J. Brüschweilera et al., (2010). Mutation Research 699, 47-54. *In vitro* genotoxicity of polychlorinated butadienes (Cl4–Cl6).

3. Aubrey Swain et al., (2011). Journal of Applied Toxicology 2011 (wileyonlinelibrary.com, DOI 10.1002/jat.1624). Urinary biomarkers in hexachloro-1:3-butadiene-induced acute kidney injury in the female Hanover Wistar rat; correlation of α-glutathione S-transferase, albumin and kidney injury molecule-1 with histopathology and gene expression.