Decision POPRC-2/6: Commercial octabromodiphenyl ether

The Persistent Organic Pollutants Review Committee,

Having examined the proposal by the European Community and its member States that are Parties to the Stockholm Convention on Persistent Organic Pollutants to list commercial octabromodiphenyl ether in Annexes A, B and/or C to the Convention and having applied the screening criteria specified in Annex D to the Convention,

Noting that the commercial product hereinunder termed commercial octabromodiphenyl ether is a mixture of brominated diphenyl ether congeners in which the main components are heptabromodiphenyl ethers (Chemicals Abstracts Service number 68928-80-3) and octabromodiphenyl ethers (CAS 32536-52-0), which have the highest concentration by weight with respect to the other components of the mixture,

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 commercial octabromodiphenyl ether, as set out in the evaluation contained in the annex to the present decision;

2. *Decides furthermore,* in accordance with paragraph 6 of Article 8 of the Convention and paragraph 29 of decision SC-1/7 of the Conference of the Parties of the Stockholm Convention, 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 2 February 2007.

Annex to decision POPRC-2/6

Evaluation of commercial octabromodiphenyl ether against the criteria of Annex D

A. Background

1. The primary source of information for the preparation of this evaluation was the proposal submitted by the European Community and its member States that are Parties to the Convention, contained in document UNEP/POPS/POPRC.2/INF/4.

2. Additional sources of scientific information included critical reviews prepared by recognized authorities, including the European Union risk assessment report on diphenyl ether, octabromo derivative.

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 information. The proposal relates to commercial octabromodiphenyl ether;

(ii) The chemical structure for the pure compound octabromodiphenyl ether was provided. Commercial octabromodiphenyl ether is a mixture of several polybrominated diphenyl ethers and congeners (pentabromodiphenyl ether isomers, hexabromodiphenyl ether

isomers, heptabromodiphenyl ether isomers, octabromodiphenyl ether isomers, nonabromodiphenyl ether isomers and decabromodiphenyl ether isomers);

The chemical identity of commercial octabromodiphenyl ether and the pure compound octabromodiphenyl ether is adequately established;

(b) Persistence:

(i) There was no degradation in an OECD test (301D) over 28 days (Ref. 3);

(ii) Elevated concentrations of polybromodiphenyl ethers, including octa and hepta bromodiphenyl ether congeners, were found in agricultural soil more than 20 years after treatment of the soil with contaminated sewage sludge, which is consistent with very long half-lives for components of commercial octabromodiphenyl ether (Ref. 2);

There is sufficient evidence that commercial octabromodiphenyl ether meets the persistence criterion;

(c) Bioaccumulation:

(i) The log Kow value for the commercial product has been determined to be around 6.29 (Ref. 3). Experimental results presented in the European Union risk assessment report indicates that octa and heptabromodiphenyl ethers have low bioconcentration factors (less than 10–36); these results have been confirmed by data presented and peer reviewed by the Japanese Government. Nevertheless, other brominated diphenyl ethers present in commercial octabromodiphenyl ether have been found to have higher bioconcentration factors, for example 11,700–17,700 for pentabromodiphenyl ethers (Ref. 3) and 1,000–5,600 for hexabromodiphenyl ethers (Ref. 3);

(ii) and (iii) Field data provide evidence for the potential for bioaccumulation of heptabromodiphenyl ether. Concentrations of 220–270 ng/g lipid weight in eggs of the peregrine falcon in northern Sweden and Greenland have been reported (Refs. 4 and 5). This evidence demonstrates that, despite its large molecular weight, the molecule is found in top predators at levels similar to those of bioaccumulable tetra and penta bromodiphenyl ether. In addition, the estimated half-life in humans is 100 days (Ref. 6), suggesting a potential for bioaccumulation. In soil biota, the soil organism accumulation factor for octabromodiphenyl ether 197 has been calculated as 2 (Ref. 2).

There is sufficient evidence that commercial octabromodiphenyl ether meets the bioaccumulation criterion;

(d) Potential for long-range environmental transport:

(i) and (iii) The vapour pressure of commercial octabromodiphenyl ether is reported to be 6.59 x 10^{-6} Pa at 21°C (Refs. 1 and 3). The atmospheric half-life of the pure compound octabromodiphenyl ether is estimated to be 76 days, which means that long-range transport is possible for the substance;

(ii) Monitoring data show that the hexa and hepta bromodiphenyl ether congeners are present in biota in remote regions (Refs. 7 and 8) and in Arctic air (Ref. 9);

There is sufficient evidence that commercial octabromodiphenyl ether meets the criterion on potential for long-range environmental transport;

(e) Adverse effects:

(i) There are no data provided on the direct toxicological effects of commercial octabromodiphenyl ether or polybromodiphenyl ether congeners in humans;

(ii) There is evidence of reproductive toxicity in mammals. The lowest no observed adverse effect level (NOAEL) from the available mammalian toxicity data for the commercial octabromodiphenyl ether product was determined as 2 mg/kg bw/day in a developmental study in rabbits (Ref. 3). Additional information on the developmental toxicity of octabromodiphenyl ether has been published recently (Ref. 10);

There is sufficient evidence that commercial octabromodiphenyl ether meets the criterion on adverse effects;

C. Conclusion

4. The Committee concluded that commercial octabromodiphenyl ether meets the screening criteria specified in Annex D.

References

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