

## Aroclor 1248; CASRN 12672-29-6

Human health assessment information on a chemical substance is included in the IRIS database only after a comprehensive review of toxicity data, as outlined in the [IRIS assessment development process](#). Sections I (Health Hazard Assessments for Noncarcinogenic Effects) and II (Carcinogenicity Assessment for Lifetime Exposure) present the conclusions that were reached during the assessment development process. Supporting information and explanations of the methods used to derive the values given in IRIS are provided in the [guidance documents located on the IRIS website](#).

### STATUS OF DATA FOR Aroclor 1248

**File First On-Line 04/01/1994**

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	qualitative discussion	04/01/1994
Inhalation RfC (I.B.)	not evaluated	
Carcinogenicity Assessment (II.)	not evaluated	

## I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

### I.A. Reference Dose for Chronic Oral Exposure (RfD)

Substance Name — Aroclor 1248  
CASRN — 12672-29-6

The health effects data for Aroclor 1248 were reviewed by the U.S. EPA RfD/RfC Work Group and determined to be inadequate for the derivation of an oral RfD. The verification status for this chemical currently is NOT VERIFIABLE. For additional information on the health effects of this chemical, interested parties are referred to the U.S. EPA documentation listed below.

NOT VERIFIABLE status indicates that the U.S. EPA RfD/RfC Work Group deemed the database at the time of review to be insufficient to derive an oral RfD according to the current

Agency guidelines. This status does not preclude the use of information in cited references for assessment by others.

Derivation of an oral RfD for Aroclor 1248 is not recommended because a Frank Effect (death of an infant) was noted at the lowest dose tested in a sensitive animal species, rhesus monkeys (*Macaca mulatta*). In general, Rhesus monkeys have shown adverse effects to PCB mixtures at doses 10-fold lower than in other species. The data indicated a dose-response relationship for this effect.

Schantz et al. (1989) evaluated neurobehavioral performance in offspring of rhesus monkeys that had been exposed to 0.03, 0.1 and 0.2 mg/kg-day of dietary Aroclor 1248 for different durations. Group I consisted of infants whose dams had received 0.03 mg/kg-day. Of the seven dams for this group, six delivered viable offspring. Necropsy of the infant who died at the time of weaning showed signs of PCB intoxication that included thymic atrophy and skin hyperpigmentation. Group II consisted of offspring of 4/8 females fed 0.1 mg/kg-day of Aroclor 1248. Of the eight dams of this group, one delivered a dead infant and one delivered an infant that died shortly after weaning with signs of PCB intoxication. Group III consisted of offspring of 3/7 females fed 0.2 mg/kg-day of Aroclor 1248. Of the seven females that were dams in this group, only three delivered live infants. Information on maternal toxicity was not provided in the report. Mild dermatological lesions and hyperpigmentation about the hairline developed in offspring in all treated groups during nursing, but no signs of toxicity were evident at the time of neurological testing (age 14 months). Offspring weights at birth and weaning were significantly reduced in Group III. Offspring in Groups I and II did not differ from controls on spatial, color or shape in two-choice discrimination reversal learning tests, but decreased performance on a shape discrimination problem was observed in Group III when irrelevant cues were inserted. On the basis of thymic atrophy and chloracne and death of 1 of 7 infants, it is concluded that 0.03 mg/kg-day represents a FEL for developmental effects.

Adult female Rhesus monkeys were fed 0, 2.5 or 5 ppm (0, 0.1 and 0.2 mg/kg-day) of Aroclor 1248 incorporated in food pellets for up to 14 months (Barsotti et al., 1976; Barsotti, 1980). The exposure period ran from 7 months prior to breeding through gestation, and then for an additional 4 months until the infants were weaned. Some treated females began showing skin changes, such as hyperpigmentation and alopecia, characteristic signs of PCB intoxication, during the first 2 months of dosing. Monkeys with less body fat were the first to show clinical signs, regardless of the dose group to which they were assigned. All treated females showed signs of PCB intoxication to some degree by 6 months. A progressive increase in SGPT values was observed for all treated monkeys and this increase was found to be statistically significant ( $p < 0.05$ ) by the 22nd month of the study, even though dosing stopped at the end of the 14th month. One female in each dose group developed severe shigellosis and died, and other dosed females developed clinical signs of shigellosis but did not die. Necropsies of deceased monkeys

showed focal necrosis and lipid deposition of the liver, as well as marked subcutaneous edema. Increased menstrual duration was noted as well as occasional amenorrhea.

For the experimental breeding trial, conducted during the dosing period, all low-dose monkeys (8/8) conceived; 3/8 aborted and 5/8 delivered live infants. However, 3 of these 5 liveborn infants showed clinical signs of PCB toxicity and, being unable to withstand the stress of weaning, died when separated from their dams. Among the high-dose monkeys, 6/8 conceived. Among these six conceptions, four ended in abortion, one infant went to term, but was stillborn. Only one normal birth occurred among this group; however, at the time of weaning, this infant showed clinical signs of PCB toxicity and died.

The investigators realized that PCB mixtures might have latent effects that could appear long after dosing had ceased. Thus, they included three additional recovery breeding periods after dosing had been completed.

The first recovery breeding trial occurred approximately 22 months after the initiation of Aroclor 1248 dosing and 8 months after dosing had stopped. For the low-dose dams, 8/8 conceived. One of these eight conceptions resulted in abortion. Of the seven livebirths, two infants died at or before weaning. Among the high-dose mothers, 7/7 conceived. There was one abortion and one stillbirth among this group of seven mothers, and five livebirths. Among the group of five livebirths, three infants died at or before weaning.

A second recovery breeding trial was conducted approximately 36 months after the completion of Aroclor 1248 dosing. Among the low-dose mothers, 5/7 conceived. There was one stillbirth and four live births. All four of the liveborn infants survived past weaning and were available for behavioral testing at 14 months and 4 years of age. Among the high-dose mothers, 4/6 conceived for this breeding trial. There were no abortions among the four conceptions, but one stillbirth did occur; there were three livebirths.

The third recovery breeding trial was conducted 55 months after the completion of Aroclor 1248 dosing. Among the low-dose dams, 7/7 conceived. There were no abortions among this group but two stillbirths did occur. All five liveborn infants survived past weaning. For the high-dose mothers, only five had normal reproductive cycles and 4/5 conceived. Among the four conceptions, one ended in abortion, another infant was stillborn and two were born live.

In the first recovery breeding trial the average birth weights for the dosed groups were found to be reduced when compared with controls. For the second recovery breeding trial, the mean weight of the test group infants was 15 and 22% below the control group.

Results of this prolonged recovery period revealed impairment of reproductive function in female Rhesus monkeys lasting for more than 4 years after dosing ceased. In the groups of infants for which birth-weight data are available, a significant reduction in mean birth weight for PCB-exposed infants is evident.

Thomas and Hinsdill (1978) performed immunologic tests after Rhesus monkeys had been fed 0, 2.5 and 5 ppm dietary Aroclor 1248 for 11 months. All treated monkeys developed facial acne and edema and swollen eyelids to varying degrees after 6 months, with pronounced alopecia occurring in the 0.2 mg/kg- day group. Following the treatment period, the monkeys were inoculated with sheep red blood cells (SRBC) and tetanus toxoid. Anti-SRBC antibody titers were significantly reduced in the 0.2 mg/kg-day group at weeks 1 and 12 after inoculation, but antibody response to tetanus toxoid was not affected by treatment at either dosage level.

Groups of three female New Zealand white rabbits were fed 0, 10, 100 or 250 ppm of Aroclor 1248 for 4 weeks and bred with untreated males (Thomas and Hinsdill, 1980). No maternal toxicity was evident. Body-weight gain was significantly reduced in the offspring in the high-dose group.

Barsotti, D.A., R.J. Marlar and J.R. Allen. 1976. Reproductive dysfunction in rhesus monkeys exposed to low levels of polychlorinated biphenyls (Aroclor 1248). *Food Cosmet. Toxicol.* 14: 99-103.

Barsotti, D.A. 1980. Gross, Clinical, and Reproductive Effects of Polychlorinated Biphenyls in the Rhesus Monkey. August. Ph.D. Thesis, available through the University Library, University of Wisconsin, Madison, WI.

Schantz, S.L., E.D. Levin, R.W. Bowman et al. 1989. Effects of perinatal PCB exposure on discrimination-reversal learning in monkeys. *Neurotoxicol. Teratol.* 11: 243-250.

Thomas, P.T. and R.D. Hinsdill. 1978. Effect of polychlorinated biphenyls on the immune responses of rhesus monkeys and mice. *Toxicol. Appl. Pharmacol.* 44: 41-51.

Thomas, P.T. and R.D. Hinsdill. 1980. Perinatal PCB exposure and its effect on the immune system of young rabbits. *Drug Chem. Toxicol.* 3: 173-184.

Agency Work Group Review — 08/12/1992, 11/04/1992, 06/16/1993, 07/20/1993

EPA Contacts:

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**I.B. Reference Concentration for Chronic Inhalation Exposure (RfC)**

Substance Name — Aroclor 1248  
CASRN — 12672-29-6

Not available at this time.

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**II. Carcinogenicity Assessment for Lifetime Exposure**

Substance Name — Aroclor 1248  
CASRN — 12672-29-6

This substance/agent has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

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**III. [reserved]**

**IV. [reserved]**

**V. [reserved]**

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**VI. Bibliography**

Substance Name — Aroclor 1248  
CASRN — 12672-29-6

### **VI.A. Oral RfD References**

Barsotti, D.A., R.J. Marlar and J.R. Allen. 1976. Reproductive dysfunction in rhesus monkeys exposed to low levels of polychlorinated biphenyls (Aroclor 1248). *Food Cosmet. Toxicol.* 14: 99-103.

Barsotti, D.A. 1980. Gross, Clinical, and Reproductive Effects of Polychlorinated Biphenyls in the Rhesus Monkey. August. Ph.D. Thesis, available through the University Library, University of Wisconsin, Madison, WI.

Schantz, S.L., E.D. Levin, R.W. Bowman et al. 1989. Effects of perinatal PCB exposure on discrimination-reversal learning in monkeys. *Neurotoxicol. Teratol.* 11: 243-250.

Thomas, P.T. and R.D. Hinsdill. 1978. Effect of polychlorinated biphenyls on the immune responses of rhesus monkeys and mice. *Toxicol. Appl. Pharmacol.* 44: 41-51.

Thomas, P.T. and R.D. Hinsdill. 1980. Perinatal PCB exposure and its effect on the immune system of young rabbits. *Drug Chem. Toxicol.* 3: 173-184.

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### **VI.B. Inhalation RfC References**

None

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### **VI.C. Carcinogenicity Assessment References**

None

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## VII. Revision History

Substance Name — Aroclor 1248

CASRN — 12672-29-6

Date	Section	Description
04/01/1994	I.A.	Oral RfD discussion on-line

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## VIII. Synonyms

Substance Name — Aroclor 1248

CASRN — 12672-29-6

Last Revised — 09/01/1992

- 12672-29-6
- Aroclor 1248
- HSDB 6356