FOREWORD INTRODUCTION

2,4-DICHLOROTOLUENE

CAS N°:95-73-8

SIDS Initial Assessment Report

For

SIAM 3

13-15 February 1995, Williamsburg, USA

1. Chemical Name: 2,4-Dichlorotoluene

2. CAS Number: 95-73-8

3. Sponsor Country: Japan
National SIDS Contact Point in Sponsor Country:
Mr. Yasuhisa Kawamura, Ministry of Foreign Affairs, Japan

4. Shared Partnership with:

5. Roles/Responsibilities of the Partners:

- Name of industry sponsor /consortium
- Process used

6. Sponsorship History

- How was the chemical or category brought into the OECD HPV Chemicals Programme ?

As a high priority chemical for initial assessment, 2,4-dichlorotoluene was selected in the framework of HPV Programme.

SIDS Dossier and Testing Plan were reviewed at a SIDS Review Meeting in March 1993, where the following SIDS Testing Plan was agreed:

no testing	( )	
testing	(X)	Physical-Chemical Properties Environmental Fate/Biodegradation Ecotoxicity Toxicity

The SIAR was discussed at SIAM 2 (September 1994) and was requested to be revised for SIAM 3. At SIAM- 3, the conclusion was approved with comments. Comments at SIAM- 3: Rearrangement of the documents.

7. Review Process Prior to the SIAM:

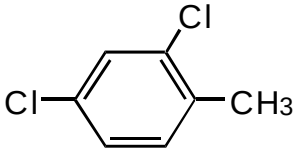
8. Quality check process:

9. Date of Submission: Date of Circulation: December 1994

10. Date of last Update:

11. Comments:

SIDS INITIAL ASSESSMENT PROFILE

CAS No.	95-73-8
Chemical Name	2,4-Dichlorotoluene
Structural Formula	

CONCLUSIONS AND RECOMMENDATIONS

It is currently considered of low potential risk and low priority for further work.

SHORT SUMMARY WHICH SUPPORTS THE REASONS FOR THE CONCLUSIONS AND RECOMMENDATIONS

Exposure

2,4-Dichlorotoluene is volatile liquid and the production volume is ca. 900 tonnes/year in 1990 – 1992 in Japan and 10,000 - 20,000 tones/year in 1984 in the EEC. This chemical is used as an intermediate for pesticides, drugs and chlorinated-nitrated benzenes in closed systems in Japan. This chemical is stable in neutral, acidic or alkaline solution, and is considered to be “not readily biodegradable”.

PECs have been calculated based on several models considering its physico-chemical properties (e.g. molecular weight, water solubility, vapour pressure and partition coefficient). The worst estimated concentrations were 1.0×10^{-8} mg/l (air), 2.5×10^{-6} mg/l (water), 9.3×10^{-4} mg/kg (soil), 1.2×10^{-3} mg/kg (sediment). A PEC_{local} was also calculated as 6.0×10^{-8} mg/l, based on a default scenario.

No monitoring data at the work place have been available. The chemical is manufactured in a closed system and is used as an intermediate for medicines etc. There are cases where the feeding to tanks and the filling are performed in open systems, but in these cases protective masks, gloves and goggles are used. So far no uses for consumers are known. Based on the physico-chemical properties, the level exposed indirectly through the environment was estimated as 3.4×10^{-4} mg/man/day. The daily intake through drinking water is estimated as 8.3×10^{-8} mg/kg/day and through fish is calculated as 2.1×10^{-6} mg/kg/day.

Environment

For the environment, various NOEC and LC_{50} values were gained from test results; 96h LC_{50} = 2.7 mg/l (acute fish); 24h EC_{50} = 19 mg/l (acute daphnia); 72h EC_{50} = 9.7 mg/l (acute algae); 21d NOEC = 2.0 mg/l (long-term daphnia reproduction). Therefore, the chemical is considered to be moderately toxic to fish and algae and slightly toxic to daphnids. As the lowest chronic toxicity data, the 21d-NOEC (reproduction) of *Daphnia magna* (2.0 mg/l) was adopted. An assessment factor of 100 was used to both acute and chronic toxicity data to determine PNEC according to the OECD Provisional Guidance for Initial Assessment of Aquatic Effects. Thus, the PNEC of the chemical is 0.02 mg/l in the present report. The PEC is lower than the PNEC. The environmental risk is presumably low.

Human Health

The chemical showed no genotoxic effects in bacteria and in a chromosomal aberration test *in vitro*.

In a combined repeat dose and reproductive/developmental toxicity screening test, dose dependent salivation was

found in all treated groups. Toxicological significant changes in haematological and blood chemical examinations were found at the highest dose (e.g. decrease of platelet count). Increased liver and kidney weights were also found at the same level with pathological remarks (e.g. centrilobular swelling of hepatocytes). For reproductive/developmental end-points, a decrease of fertility was found in conjunction with normal copulation but with low pregnancy at the highest dose. However, no histopathological change related to infertility was seen in the paternal organs. Decreases of pup body weights were noted in the highest dose group during the lactation period. Therefore, the overall NOEL was less than 12.5 mg/kg/day for repeated dose toxicity and 79 mg/kg/day for reproductive toxicity.

As for indirect exposure via environment, the daily intake through drinking water is estimated to be 8.3×10^{-8} mg/kg/day and through fish is calculated as 2.1×10^{-6} mg/kg/day. The margin of safety is large. Therefore, health risk through the environment, in general, is considered to be presumably low due to its use pattern and exposure situation.

In conclusion, no further testing is needed at present considering its toxicity and exposure levels.

NATURE OF FURTHER WORK RECOMMENDED

FULL SIDS SUMMARY

CAS NO: 95-73-8		SPECIES	PROTOCOL	RESULTS
PHYSICAL-CHEMICAL				
2.1	Melting Point			- 13.5 °C
2.2	Boiling Point			200 °C (at 1013 hPa)
2.3	Density			1.25 g/cm^3
2.4	Vapour Pressure		OECD TG 104	38 Pa at 25 °C
2.5	Partition Coefficient (Log Pow)		OECD TG 107	4.10 at 25 °C
2.6 A.	Water Solubility		OECD TG 105	25 mg/L at 25 °C
B.	PH			No data available.
	PKa		OECD TG 112	Not observed.
2.12	Oxidation: Reduction Potential			No data available.
ENVIRONMENTAL FATE AND PATHWAY				
3.1.1	Photodegradation		estimation	$T_{1/2}$ = 90.7 y (direct photodegradation in water)
3.1.2	Stability in Water		OECD TG 111	Stable (pH 4.0, 7.0, 9.0)
3.2	Monitoring Data			Not detected from surface water and Sediment in Japan in 1981.
3.3	Transport and Distribution		Calculated, fugacity model level III (MNSEM-147S)	In Air 1.0E-8 mg/L In Water 2.5E-6 mg/L In Soil 9.3E-4 mg/g In Sediment 1.2E-3 mg/g
3.5	Biodegradation		OECD TG 301C	Not readily biodegradable: 0 % (BOD) in 28 days, 0 % (GC) in 28 days
3.6	Bioaccumulation			No data available
ECOTOXICOLOGY				
4.1	Acute/Prolonged Toxicity to Fish	*Oryzias latipes*	OECD TG 203	LC_{50} (72hr): 2.9 mg/L LC_{50}(96hr): 2.7 mg/L
4.2	Acute Toxicity to Aquatic Invertebrates (*Daphnia*)	*Daphnia magna*	OECD TG 202	EC_{50} (24hr): 19 mg/l
4.3	Toxicity to Aquatic Plants e.g. Algae	*Selenastrum capricornutum*	OECD TG 201	EC_{50} (72hr): 9.7 mg/l
4.5.1	Chronic Toxicity To Fish	*Peoecilia reticulata*		LC_{50}(14dr):4.64mg/l
4.5.2	Chronic Toxicity to Aquatic Invertebrates (*Daphnia*)	*Daphnia magna*	OECD TG 202	LC_{50} (21d, Mortality): > 2.0 mg/l EC_{50} (21d, Repro): > 2.0 mg/l NOEC: 2.0 mg/l
4.6.1	Toxicity to Soil Dwelling Organisms			No data available.
4.6.2	Toxicity to Terrestrial Plants			No data available.

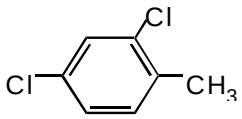
CAS NO: 95-73-8		SPECIES	PROTOCOL	RESULTS
(4.6.3)	Toxicity to Other Non-Mammalian Terrestrial Species (Including Birds)			No data available
TOXICOLOGY				
5.1.1	Acute Oral Toxicity	Rat	OECD TG 401	LD_{50}: 2,790 mg/kg
5.1.2	Acute Inhalation Toxicity			LD_{50}: > 2,669 mg/kg
5.1.3	Acute Dermal Toxicity			No data available.
5.4	Repeated Dose Toxicity	Rat	OECD Combined Test	NOEL = < 12.5 mg/kg/day
5.5	Genetic Toxicity In Vitro			
A.	Bacterial Test (Gene mutation)	*S. .typhimurium* *E. coli*	OECD Guidelines No.471 and 472 and Guidelines for Screening Mutagenicity Testing of Chemicals (Japan)	Negative (With metabolic activation) Negative (Without metabolic activation)
B.	Non-Bacterial In Vitro Test (Chromosomal aberrations)	CHL cells	OECD Guideline No.473 and Guidelines for Screening Mutagenicity Testing of Chemicals (Japan)	Negative (With metabolic activation) Negative (Without metabolic activation)
5.6	Genetic Toxicity In Vivo			No data available.
5.8	Toxicity to Reproduction	Rat	OECD Combined Test	NOEL Parental = 79 mg/kg/day NOEL F1 offspring = 79 mg/kg/day
5.9	Developmental Toxicity/ Teratogenicity	Rat	OECD Combined Test	NOEL Maternal toxicity = 79 mg/kg/day NOEL Teratogenicity = 500 mg/kg/day
5.11	Experience with Human Exposure			

SIDS Initial Assessment Report

1 IDENTITY

1.1 Identification of the Substance

CAS Number: 95-73-8
IUPAC Name: 2,4-Dichlorotoluene
Molecular Formula: $C_7H_6Cl_2$
Structural Formula:



1.2 Purity/Impurities/Additives

Degree of Purity: > 98.5 %

Major Impurities: 2,5-Dichlorotoluene: < 1.5 %

Essential Additives: No additives

1.3 Physico-Chemical properties

Table 1 Summary of physico-chemical properties

Property	Value
Melting point	- 13.5 °C
Boiling point	200 °C at 1013 hPa
Relative density	1.25 g/cm^3
Vapour pressure	38 Pa at 25 °C
Water solubility	25 mg/L at 25 °C
Partition coefficient n-octanol/water (log value)	4.10 at 25 °C

2 GENERAL INFORMATION ON EXPOSURE

2.1 Production Volumes and Use Pattern

2,4-Dichlorotoluene is volatile stable liquid, and the production volume is ca. 900 tonnes/year in 1990 - 1992 in Japan, and 10,000 – 20,000 tonnes/year in EEC in 1984.

This chemical is used as an intermediate for pesticides and medicinal drugs in closed systems in Japan.. Release to the environment may occur at the production site and at specific industrial sites. All disposal wastes are treated by incineration. 2,4-Dichlorotoluene seems to be released into water and air from its production sites after biological treatment. In a Japanese monitoring program of the Environment Agency, this chemical was not detected in the general environment in 1987. No specific monitoring data of the chemical is available. This chemical is stable in neutral, acidic or alkaline solutions, and is classified as "not readily biodegradable".

2.2 Environmental Exposure and Fate

2.2.1 Photodegradation

The half-life time of 90.7 years is estimated for the degradation of 2,4-dichlorotoluene in water by direct photodegradation (MITI, Japan).

2.2.2 Stability in Water

The chemical is stable in water at pH 4, 7 and 9 (OECD TG 111).

2.2.3 Biodegradation

If released into water, this substance is not readily biodegraded (MITI (I), corresponding to the OECD 301C: 0 % biodegradation during 28 days based on BOD and 0 % based on GC analysis).

2.2.4 Bioaccumulation

No data are available.

2.2.5 Estimates of environmental fate, pathway and concentration

The potential environmental distribution of 2,4-dichlorotoluene obtained from a generic fugacity model, Mackay level III, under emission scenarios is shown in Table I. The results show that when the chemical is released into water, the majority of the chemical is likely todistributed into soil and sediment

PECs have been calculated based on several models (MNSEM, CHEMCAN, CHEMFRANCE) considering its physico-chemical properties (e.g. molecular weight, water solubility, vapour pressure and partition coefficient). The estimated concentrations of MNSEM model were 1.0×10^{-8} mg/l (air), 2.5×10^{-6} mg/l (water), $9.3 \times 10^{--4}$ mg/kg (soil), 1.2×10^{-3} mg/kg (sediment). A PEC_{local} in surface water was also caluculated as 6.0×10^{-8} mg/l, based on a default scenario. In Japanese monitoring program by Environment Agency, this chemical was not detected from general environment in 1987. The chemical is used in closed system, and no data for consumer use are available. Based on the physico-chemical properties, the total exposed dose indirectly through the

environment was estimated as 3.4×10^{-4} mg/man/day. Also, the daily intake through drinking water is estimated as 5.0×10^{-6} mg/man/day (i.e. approx 8.3×10^{-8} mg/kg/day) and through fish is calculated as 1.3×10^{-4} mg/man/day (i.e. approx 2.1×10^{-6} mg/kg/day).

Global situation:

Method: MNSEM 147S

Results: Steady state mass and concentration calculated using MNSEM 147S

Air:	1.0E-08 [mg/l]
Water:	2.5E-06 [mg/l]
Soil:	9.3E-04 [mg/kg dry solid]
Sediment:	1.2E-03 [mg/kg dry solid]

Exposure dose

Inhalation of air:	2.0E-04 [mg/day]
Drinking water:	5.0E-06 [mg/day]
Ingestion of fish:	1.3E-04 [mg/day]
meat:	2.9E-08 [mg/day]
milk:	3.1E-08 [mg/day]
vegetation:	1.2E-05 [mg/day]
Total exposure dose:	3.4E-04 [mg/day]

Remarks: Input data:

Molecular weight:	161.03
Water solubility:	25.00 [mg/l]
Vapor pressure:	38 Pa
Log Pow:	4.10

MNSEM 147S is a slightly revised version of MNSEM 145I.

1. addition of air particle compartment to air phase
2. execution of calculation on a spreadsheet program

Table 2. Comparison of calculated environmental concentration using several methods (Japanese environmental conditions are applied to the calculations.)

Model	Air[mg/l]	Water[mg/l]	Soil[mg/kg]	Sediment[mg/kg]
MNSEM	1.0E-08	2.5E-06	9.3E-04	1.2E-03
CHEMCAN2	1.8E-07	2.9E-06	5.5E-04	8.7E-04
CHEMFRAN	1.8E-07	3.2E-06	5.9E-04	9.7E-04

Local exposure assessment (1)

1. Production volume: 438 tonnes/year

2. Emission volume: to water 662 kg/year
to air 20 kg/year

3. Calculation of PEC_{local}

PEC_{local} = W x 1/Q x (100-P)/100 x 1/D = 6 x 10^{-8} mg/l
W: 662 kg/year
Q: 1100000 m^3/year
P: 90%
D: 1000 assuming the dilution with sea water. The actual dilution rate must be higher because the treated waste water is directly released to the Tokyo Bay.

Local exposure assessment (2)

1. Production volume: 150 tonnes/year

2. Emission volume: to water none
to air 0.7 kg/year
waste material none

2.3 Human Exposure

2.3.1 Occupational Exposure

No data on work place monitoring have been reported.

2.3.2 Consumer Exposure

No data on consumer exposure are available.

3 HUMAN HEALTH HAZARDS

3.1 Effects on Human Health

3.1.1 Acute Toxicity

LD_{50} in acute oral toxicity studies in rats were reported as > 2,000 mg/kg or 2,790 mg/kg. Also, the LC_{50} in an acute inhalation toxicity study in rats was > 2,669 mg/kg/4h.

3.1.2 Repeated Dose Toxicity

Studies in Animals

Oral

There is only one key study on repeated dose toxicity of 2,4-dichlorotoluene. This chemical was studied for oral toxicity in rats according to the OECD combined repeated dose and reproductive/developmental toxicity test [OECD TG 422]. As the study was well controlled and conducted under GLP, this was appropriate to be regarded as a key study. Male and female SD rats were orally administered (gavage) at doses of 0, 12.5, 79 and 500 mg/kg/day. In male rats, the administration period was two weeks prior to mating, 2 weeks of mating and 2 weeks after the completion of the mating period. In females, in addition to a maximum four weeks pre-mating and mating period, they were exposed through pregnancy until day 3 of post delivery.

Dose dependent salivation was noted immediately after administration in all treated groups. Decreases in body weight gain were noted in the females of the 500 mg/kg group at the gestation and lactation periods. In food consumption, decreases were noted in both sexes of the 500 mg/kg groups. In hematological and blood chemical examinations, decreases in platelet count, alfa-globulin fraction, triglyceride and blood urea nitrogen, and increase in cholinesterase were noted in the 500 mg/kg male group. In organ weights of the 500 mg/kg group, increased relative liver weights in both sexes, and of the relative kidney weights in the males were noted. In autopsy, dark brown discoloration of the liver was noted in 500 mg/kg male group. In histopathological examination of the liver, centrilobular swelling of hepatocytes was noted in all males of the 500 mg/kg group and 2 males of the 79 mg/kg group. In kidneys, atrophy and regeneration of tubular epitherium, and dilation of tubules were noted in the 79 mg/kg groups and above. In addition, the number of the males with hyalin droplets and eosinophilic depositions in tubular epitherium increased progressively in the 79 and 500 mg/kg groups. On the basis of above-described effects, the NOEL for this compound was indicated to be less than 12.5 mg/kg/day.

3.1.3 Mutagenicity

In vitro Studies

Bacterial test

A reverse gene mutation assay was conducted in line with Guidelines for Screening Mutagenicity Testing of Chemicals (Japan) and OECD Test Guidelines 471 and 472, using the pre-incubation method. This study was well controlled and regarded as a key study.

2,4-Dichlorotoluene showed negative results in *Salmonella typhimurium* TA100, TA1535, TA98, TA1537 and *Escherichia coli* WP2 *uvr*A at concentrations up to 1 mg/plate with or without metabolic activation system (MHW, 1993).

Non-bacterial test

A chromosomal aberration test in line with Guidelines for Screening Mutagenicity Testing of Chemicals (Japan) and OECD Test Guideline 473 was conducted using cultured Chinese Hamster lung (CHL/IU) cells. This study was well controlled and regarded as a key study. The maximum concentration of the chemical was used within no apparent cytotoxic effect in continuous treatment. In short term treatment, it was set to 90 ug/ml.

No structural chromosomal aberrations or polyproidy were observed up to a maximum concentration in both continuous treatment and short-term treatment with or without an exogeneous metabolic activation system (MHW, 1998).

In vivo Studies

No data are available on *in vivo* genotoxic effects.

3.1.4 Toxicity for Reproduction

2,4-Dichlorotoluene was studied for oral toxicity in rats according to the OECD combined repeated dose and reproductive/developmental toxicity test [OECD TG 422] at doses of 0, 12.5, 79, 500 mg/kg/day. Although this combined study was designed to investigate reproductive capability in parental generation as well as development in F_1 offspring, parameters to evaluate developmental toxicity were limited to only body weights at day 0 and day 4 after birth, and autopsy findings at day 4.

Regarding reproductive ability, all pairs in the 12.5 and 79 mg/kg groups achieved pregnancy. In the 500 mg/kg group, 12 pairs showed evidence of copulation with a sperm positive vaginal smear, however, only 5 pairs out of them achieved pregnancy. In six non-pregnant pairs in the 500 mg/kg group, vaginal plugs were not noted or a few sperm were found in the vaginal smears. This result suggests that the male reproductive organs and secondary reproductive organs had functional disorders. Regarding body weight changes of pups, decreases in liver and body weights were noted in the 500 mg/kg group on day 1 of lactation. For delivery or lactating behavior of dams, viability, general appearance or autopsy of pups, no effects related to the administration of this chemical was noted. On the basis of above-described effects, the NOEL for reproductive/ developmental toxicity for both sexes was considered to be 79 mg/kg/day.

3.2 Initial Assessment for Human Health

No monitoring data at the work place have been available. The chemical is manufactured in a closed system and is used as an intermediate for medicines etc. There are cases where the feeding to tanks and the filling are performed in open systems, but in these cases protective masks, gloves and goggles are used. So far no uses for consumers are known. Based on the physico-chemical properties, the level exposed indirectly through the environment was estimated as 3.4×10^{-4} mg/man/day. The daily intake through drinking water is estimated as 8.3×10^{-8} mg/kg/day and through fish is calculated as 2.1×10^{-6} mg/kg/day.

The chemical showed no genotoxic effects in bacteria and in a chromosomal aberration test *in vitro*.

In a combined repeat dose and reproductive/developmental toxicity screening test, dose dependent salivation was found in all treated groups. Toxicological significant changes in haematological and blood chemical examinations were found at the highest dose (e.g. decrease of platelet count). Increased liver and kidney weights were also found at the same level with pathological remarks (e.g. centrilobular swelling of hepatocytes). For reproductive/developmental end-points, a decrease of fertility was found in conjunction with normal copulation but with low pregnancy at the highest

dose. However, no histopathological change related to infertility was seen in the paternal organs. Decreases of pup body weights were noted in the highest dose group during the lactation period. Therefore, the overall NOEL was less than 12.5 mg/kg/day for repeated dose toxicity and 79 mg/kg/day for reproductive toxicity.

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4 HAZARDS TO THE ENVIRONMENT

4.1 Aquatic Effects

2,4-Dichlorotoluene has been tested in a limited number of aquatic species (*Selenastrum capricornutum*, *Daphnia magna* and *Oryzias latipes*), under OECD test guidelines [OECD TG 201, 202, 203]. The daphnid reproduction test (OECD TG 202, Part 2, EA Japan 1992) showed 100 % mortality of the parental daphnids at concentrations above 6.2 mg/l of the chemical. In the lower concentrations the mortalities of parental daphnids were as high as in the vehicle control at which five daphnids died among 40 individuals at the start of the test. Therefore the 21d LC50 was > 2.0 mg/l (less than 6.2 mg/l). The mean number of offspring produced per adults for 21 days was reported to be 29.6, 27.6 and 23.2 individuals at the concentrations of 0.2, 0.62 and 2.0 mg/l, respectively. These result showed that the dose-response relationship was obscure and thus the 21d EC50 on reproduction was regarded to be > 2.0 mg/l, however all daphnids at the concentration above (6.2 mg/l) died. Acute and chronic toxicity data to test organisms for the chemical are summarized in Table 3. No other ecotoxicological data are available.

Various NOEC and LC_{50} values were gained from the above tests; 96h LC_{50} = 2.7 mg/l (acute fish); 24h LC_{50} = 19 mg/l (acute daphnia); 72h EC_{50} = 9.7 mg/l (acute algae); 21d-NOEC = 2.0 mg/l (long-term daphnia reproduction). Therefore, the chemical is considered to be moderately toxic to fish and daphnids and slightly toxic to algae. The lowest chronic toxicity result is the 21 d-NOEC (reproduction) of *Daphnia magna* (2.0 mg/l). An assessment factor of 100 is applied. Thus PNEC of 2,4-dichlorotoluene is 0.02 mg/l. Since the PEC is lower than the PNEC, environmental risk is presumably low.

Table 3. Acute and chronic toxicity data of 1,4-diethylbenzene to aquatic organisms.

Species	Endpoint[*1]	Conc. (mg/L)	Reference
Selenastrum capricornutum (algae)	Biomass: EC_{50} (72h)	9.7 mg/L	EA, Japan. (1992)
Daphnia magna (water flea)	Mor: LC_{50}(24h) Mor: LC_{50}(21d) Rep: EC_{50}(21d) NOEC(21d)	19 mg/L >2.0 mg/L >2.0 mg/L 2.0 mg/L	
Oryzias latipes (fish, Medaka)	Mor: LC_{50}(24h) Mor: LC_{50}(72h) Mor: LC_{50}(96h)	5.4 mg/L 2.9 mg/L 2.7 mg/L	
Poecilia reticulata (fish, Guppy)	Mor:LC50(14d)	4.64 mg/l	Koenemann (1981)

Notes: [*1] Mor; mortality, Rep; reproduction.

4.2 Initial Assessment for the Environment

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intermediate for pesticides, drugs and chlorinated-nitrated benzenes in closed systems in Japan. This chemical is stable in neutral, acidic or alkaline solution, and is considered to be “not readily biodegradable”.

PECs have been calculated based on several models considering its physico-chemical properties (e.g. molecular weight, water solubility, vapour pressure and partition coefficient). The worst estimated concentrations were 1.0×10^{-8} mg/l (air), 2.5×10^{-6} mg/l (water), 9.3×10^{-4} mg/kg (soil), 1.2×10^{-3} mg/kg (sediment). A PEC_{local} was also calculated as 6.0×10^{-8} mg/l, based on a default scenario.

For the environment, various NOEC and LC_{50} values were gained from test results; 96h LC_{50} = 2.7 mg/l (acute fish); 24h EC_{50} = 19 mg/l (acute daphnia); 72h EC_{50} = 9.7 mg/l (acute algae); 21d NOEC = 2.0 mg/l (long-term daphnia reproduction). Therefore, the chemical is considered to be moderately toxic to fish and algae and slightly toxic to daphnids. As the lowest chronic toxicity data, the 21d-NOEC (reproduction) of *Daphnia magna* (2.0 mg/l) was adopted. An assessment factor of 100 were used to both acute and chronic toxicity data to determine PNEC according to the OECD Provisional Guidance for Initial Assessment of Aquatic Effects. Thus, the PNEC of the chemical is 0.02 mg/l in the present report. The PEC is lower than the PNEC. The environmental risk is presumably low.

5 RECOMMENDATIONS

In conclusion, no further testing is needed at present considering its toxicity and exposure levels

6 REFERENCES

Aldrich: Catalog Handbook of Fine Chemicals

Bayer AG Unpublished report

Bayer AG (1981) Unpublished report

Bayer AG (1990) Unpublished report

EA, Japan (1983) Environment Monitoring of Chemicals - Environmental Survey Report of F.Y. 1980 and 1981 (Office of Health Studies, Environmental Health Department, EA, Japan)

EA, Japan (1992) "Investigation of the Ecotoxicological Effects of OECD High Production Volume Chemicals", Office of Health Studies, Environmental Health Department, Environment Agency, Japan (HPV/SIDS Test conducted by EA, Japan)

EA and MITI, Japan (1993) Unpublished Report on Exposure Estimation (HPV/SIDS Test conducted by EA and MITI, Japan)

Encyclopedia Chimica, 4, 227

Hermens J. et al. (1984) Aquat. toxicol., 5, 143-154

Konemann H. (1981) Toxicology 19, 209-221

Lyman, W.J., W. F. Reehl and D. H. Rosenblatt (1981) "Handbook of Chemical Property Estimation Method", McGraw Hill Book Co.

MHW, Japan (1993a) Unpublished Report on Acute Toxicity Test of 2,4-Dichlorotoluene. (HPV/SIDS Test conducted by MHW, Japan)

MHW, Japan (1993b) Unpublished Report on Combined Repeat Dose and Reproductive/Developmental Toxicity Screening Test of 2,4-Dichlorotoluene. (HPV/SIDS Test conducted by MHW, Japan)

MHW, Japan (1993c) Unpublished Report on Mutagenicity Test of 2,4-Dichlorotoluene. (HPV/SIDS Test conducted by MHW, Japan)

MITI, Japan: Unpublished data

MITI, Japan (1993): Unpublished Report (1993) (HPV/SIDS Test conducted by MITI, Japan. Test was performed in Chemicals Inspection and Testing Institute, Japan)

Zoeteman B.C.J. et al. (1980) Chemosphere 9, 231

SIDS DOSSIER

2,4-DICHLOROTOLUENE

CAS NO. 95-73-8

SPONSOR COUNTRY: JAPAN

SIDS PROFILE

1.01 A.	**CAS No.**	95-73-8
1.01 C.	**CHEMICAL NAME (OECD Name)**	2,4-Dichlorotoluene
1.01 D.	**CAS DESCRIPTOR**	Not applicable
1.01 G.	**STRUCTURAL FORMULA**	$C_7H_5Cl_2$
	OTHER CHEMICAL IDENTITY INFORMATION	
1.5	**QUANTITY**	In Japan, approx 900 tonnes in 1990 - 1992.
1.7	**USE PATTERN**	In Japan, intermediates for pesticides and medicinal drugs in closed system
1.9	**SOURCES AND LEVELS OF EXPOSURE**	1. Amount released from production site to water is negligible. 2. Amount released to air from production site is less than 20 kg/year (estimation) 3. Information on consumer exposure is not available.
ISSUES FOR DISCUSSION (IDENTIFY, IF ANY)		

S I D S S U M M A R Y

CAS NO: 95-73-8		Information	OECD Study	GLP	Other Study	Estimation Method	Acceptable	SIDS Testing Required
STUDY		**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**
PHYSICAL-CHEMICAL DATA								
2.1	Melting Point	Y	N	N	Y	N	Y	N
2.2	Boiling Point	Y	N	N	Y	N	Y	N
2.3	Density	Y	N	N	Y	N	Y	N
2.4	Vapour Pressure	N						Y
2.5	Partition Coefficient	N						Y
2.6	Water Solubility	N						Y
	pH and pKa values	N						N
OTHER P/C STUDIES RECEIVED								
ENVIRONMENTAL FATE and PATHWAY								
3.1.1	Photodegradation	N						Y
3.1.2	Stability in water	N						Y
3.2	Monitoring data	Y	N	N	Y	N	Y	N
3.3	Transport and Distribution	N						N
3.5	Biodegradation	N						Y
3.6	Bioaccumulation	N						N
OTHER ENV FATE STUDIES RECEIVED								
ECOTOXICITY								
4.1	Acute toxicity to Fish	N						Y
4.2	Acute toxicity to Daphnia	N						Y
4.3	Toxicity to Algae	N						Y
4.5.2	Chronic toxicity to Daphnia	N						Y
4.6.1	Toxicity to Soil dwelling organisms	N						N
4.6.2	Toxicity to Terrestrial plants	N						N
4.6.3	Toxicity to Birds	N						N
OTHER ECOTOXICITY STUDIES RECEIVED								
TOXICITY								
5.1.1	Acute Oral	Y	N	N	Y	N	Y	N
5.1.2	Acute Inhalation	Y	N	N	Y	N	Y	N
5.1.3	Acute Dermal	N						N
5.4	Repeated Dose	N						Y
5.5	Genetic Toxicity *in vitro*							
	. Gene mutation	N						Y
	. Chromosomal aberration	N						Y
5.6	Genetic Toxicity *in vivo*	N						N
5.8	Reproduction Toxicity	N						Y
5.9	Development / Teratogenicity	N						Y
5.11	Human experience	N						N
OTHER TOXICITY STUDIES RECEIVED								

1.01 SUBSTANCE INFORMATION

A.	CAS-No	95-73-8
B.	Name (IUPAC name)	1-Methyl-2, 4-dichlorobenzene
C.	Name (OECD name)	2,4-Dichlorotoluene
D.	CAS Descriptor	Not applicable
E.	EINECS-Number	201-163-2
F.	Molecular Formula	C7 H6 Cl2
G.	Structural Formula	
H.	Substance Group	Not applicable
I.	Substance Remark	
J.	Molecular Weight	161.03

1.02 OECD INFORMATION

A. Sponsor Country: Japan

B. Lead Organisation:

Name of Lead Organisation: Ministry of Health and Welfare (MHW)
Ministry of International Trade and Industry (MITI)
Environment Agency (EA)

Contact person: Mr. Yasuhisa Kawamura
Director
Second International Organization Bureau
Ministry of Foreign Affairs

Address: 2-2-1 Kasumigaseki, Chiyoda-ku
Tokyo 100, Japan
TEL 81-3-3581-0018
FAX 81-3-3503-3136

C. Name of responder: Same as above contact person

1.1 GENERAL SUBSTANCE INFORMATION

A. Type of Substance

element [ ]; inorganic [ ]; natural substance [ ]; organic [X]; organometallic [ ]; petroleum product [ ]

B. Physical State

gaseous [ ]; liquid [X]; solid [ ]

C. Purity > 98.5 % (weight/weight)

1.2 SYNONYMS 2,4-Dichlortoluol

1.3 IMPURITIES Name: 2,5-Dichlorotoluene
Value: < 1.5 %

1.4 ADDITIVES None

1.5 QUANTITY

Location	Production (tonnes)	Date
Japan	900 t/year	1990-1992
EEC	10,000 - 20,000 t/y	1984

Location	Export (tonnes, India)	Date
Japan	50	1990
	10	1991
	30	1992
	50	1993

Reference: MITI, Japan
ECDIN Database (1993)

1.6 LABELLING AND CLASSIFICATION

None

1.7 USE PATTERN

A. General

Type of Use:	Category:
(a) main industry use	Intermediate for pesticides and medicinal drugs (closed system)
(b) main industry use	Intermediate for chlorinated-nitrated benzenes, pesticides and other applications

Reference: (a) MITI, Japan
(b) ECDIN Database (1993)

B. Uses in Consumer Products

None

1.8 OCCUPATIONAL EXPOSURE

Source	Number of workers exposed	Frequency & duration of exposure	emission data
Maintenance	1	20 min/month	
Sampling	3	12 min/day	< 1 ppm

Reference: MITI, Japan

1.9 SOURCES OF EXPOSURE

(a)
Source: Media of release: Water from a production site
Quantities per media: Negligible small
Reference: MITI, Japan

(b)
Source: Media of release: Air from a production site
Quantities per media: < 20 kg/year (estimation)
References: MITI, Japan

1.10 ADDITIONAL REMARKS

A. Options for disposal Incineration

Reference: MITI, Japan

B. Other remarks None

2.1 MELTING POINT

Value:	- 13.5 degrees C
Decomposition:	Yes [ ] No [X] Ambiguous [ ]
Sublimation:	Yes [ ] No [X] Ambiguous [ ]
Method:	Unknown
GLP:	Yes [ ] No [ ] ? [X]
Remarks:	None
Reference:	(a) Encyclopedia Chimica (b) Bayer AG (1990)

2.2 BOILING POINT

Value:	200 degrees C
Pressure:	at 1013 hPa
Decomposition:	Yes [ ] No [X] Ambiguous [ ]
Method:	Unknown
GLP:	Yes [ ] No [ ] ? [X]
Remarks:	None
Reference:	(a) Aldrich Chem. Co. (b) Bayer AG (1990)

2.3 DENSITY (Relative density)

Type:	Bulk density [ ]; Density [X]; Relative Density [ ]
Value:	1.25 g/cm3
Temperature:	20 degrees C
GLP:	Yes [ ]; No [ ]; ? [ ]
Reference:	Bayer AG (1990)

2.4 VAPOUR PRESSURE

(a)

Value:	38 Pa
Temperature:	25 degrees C
Method:	calculated [ ]; measured [X] OECD Test Guideline 104 Dynamic Method
GLP:	Yes [X] No [ ] ? [ ]
Remarks:	Purified substance (98%) used
Reference:	MITI, Japan (1993)

(b)

Value:	4 hPa
Temperature:	50 degrees C
Method:	calculated [ ]; measured [X]
GLP:	Yes [ ] No [ ] ? [X]
Remarks:	
Reference:	Bayer AG (1990)

2.5 PARTITION COEFFICIENT log10Pow

(a)

Log Pow:	4.10
Temperature:	25 degrees C
Method:	calculated [ ]; measured [X] OECD Test Guideline 107
GLP:	Yes [X] No [ ] ? [ ]
Remarks:	None
Reference:	MITI, Japan (1993)

(b)

Log Pow:	4.24
Temperature:	25 degrees C
Method:	calculated [X]; measured [ ]
GLP:	Yes [ ] No [ ] ? [X]
Remarks:	None
Reference:	THOR database (1989)

2.6 WATER SOLUBILITY

A. Solubility

Value:	25 mg/l
Temperature:	25 degrees C
Description:	Miscible[ ]; Of very high solubility [ ]; Of high solubility [ ]; Soluble [ ]; Slightly soluble [ ]; Of low solubility [X]; Of very low solubility [ ]; Not soluble [ ]
Method:	calculated [ ]; measured [X]
GLP:	Yes [X] No [ ] ? [ ]
Remarks:	
Reference:	MITI, Japan (1993)

B. pH Value, pKa Value Not applicable

2.7 FLASH POINT

Value:	(1) 87 degrees C (2) 101 degrees C
Type of test:	Closed cup [X]; Open cup [ ]; Other [ ] Closed cup [ ]; Open cup [X]; Other [ ]
Method:	(1) tag closed cup (2) open cup
GLP:	Yes [ ] No [ ] ? [X]
Remarks:	
Reference:	Unpublished company data

2.8 AUTO FLAMMABILITY

Not applicable

2.9 FLAMMABILITY

Value:	Flame point 89 degrees C
Results:	Extremely flammable[ ];Extremely flammable-liquified gas[]; Highly Flammable [ ]; Flammable [X]; Non flammable [ ]; Spontaneously flammable in air [ ]; Contact with water liberates highly flammable gases [ ]; Other [ ]
Method:	Unknown
GLP:	Yes [ ] No [ ] ? [X]
Remarks:	
Reference:	Bayer AG (1990)

2.10 EXPLOSIVE PROPERTIES

No studies located

2.11 OXIDIZING PROPERTIES

No studies located

2.12 OXIDATION: REDUCTION POTENTIAL

No studies located

2.13 ADDITIONAL DATA

A. Partition co-efficient between soil/sediment and water (Kd)

No studies located

B. Other data

No studies located

3.1 STABILITY

3.1.1 PHOTODEGRADATION

Type: Air [ ]; Water [X]; Soil [ ]; Other [ ]
Light source: Sun light [X]; Xenon lamp [ ]; Other [ ]
Light spectrum:
Relative intensity:
Spectrum of substance: epsilon = 2.58 at 300 nm
Concentration of Substance:
Estimated parameter for calculation:

	Quantum yield	0.01
	Concentration	5 x 10-5 M
	Depth of water body	500 cm
	Conversion rate	6.023 x 1020
Results:	Degradation rate	1.21 x 10-14 mol/l/s
	Half life	90.7 years

Reference: Lyman, W. J., et al. (1981)

3.1.2 STABILITY IN WATER

Type: Abiotic (hydrolysis) [X]; biotic (sediment) [ ]
Half life: Not hydrolysed at pH 4, 7 and 9
Method: OECD Test Guideline 111
GLP: Yes [X] No [ ] ? [ ]
Test substance: 2,4-Dichlorotoluene, purity: > 98.5 %
Remarks: None
Reference: MITI, Japan (1993)

3.1.3 STABILITY IN SOIL

No studies located

3.2 MONITORING DATA (ENVIRONMENT)

(a)
Type of Measurement: Background [ ]; At contaminated Site [ ]; Other [X]
Media: Surface water
Results: ND (Detection limits: 6 60 µg/l) in 7 areas in Japan as of 1981
Remarks:
Reference: EA, Japan (1983)

(b)
Type of Measurement: Background [ ]; At contaminated Site [ ]; Other [ ]
Media: Surface water in River
Results: 0.3 µg/l in 1977 79
Remarks:
Reference: Zoeteman et.al. (1980)

(c)
Type of Measurement: Background [ ]; At contaminated Site [ ]; Other [ ]
Media: Ground water
Results: ND in 1977 79
Remarks:
Reference: Zoeteman et.al. (1980)

(d)
Type of Measurement: Background [ ]; At contaminated Site [ ]; Other [X]
Media: Sediment
Results: ND (Detection limits: 0.15mg/l) in 7 areas in Japan as of 1981
Remarks:
Reference: EA, Japan (1983)

3.3 TRANSPORT AND DISTRIBUTION BETWEEN ENVIRONMENTAL COMPARTMENTS INCLUDING ESTIMATED ENVIRONMENTAL CONCENTRATIONS AND DISTRIBUTION PATHWAYS

3.3.1 TRANSPORT

No studies located

3.3.2 THEORETICAL DISTRIBUTION (FUGACITY CALCULATION)

Media: Air-biota [ ]; Air-biota-sediment-soil-water [ ]; Soil-biota [ ]; Water-air [ ]; Water-biota [ ]; Water-soil [ ]; Other [X] (Air-soil-water-sediment)
Method: Fugacity level I [ ]; Fugacity level II [ ]; Fugacity level III [X]; Fugacity level IV [ ]; Other(calculation) [ ]; Other (measurement)[ ]
Results: Steady state mass and concentration calculated using MNSEM 147S

Air:	1.0E 08 [mg/l]
Water:	2.5E 06 [mg/l]
Soil:	9.3E 04 [mg/kg dry solid]
Sediment:	1.2E 03 [mg/kg dry solid]

Exposure dose

Inhalation of air:	2.0E 04 [mg/day]
Drinking water:	5.0E 06 [mg/day]
Ingestion of fish:	1.3E 04 [mg/day]
meat:	2.9E 08 [mg/day]
milk:	3.1E 08 [mg/day]
vegetation:	1.2E 05 [mg/day]
Total exposure dose:	3.4E 04 [mg/day]

Remarks: Input data:

Molecular weight:	161.03
Water solubility:	25.00[mg/l]
Vapor pressure:	38Pa[mmHg]

Log Pow: 4.10

MNSEM 147S is a slightly revised version of MNSEM 145I.
1. addition of air particle compartment to air phase
2. execution of calculation on a spreadsheet program

Comparison of calculated environmental concentration using several methods (Japanese environmental conditions are applied to the calculations.)

Model	Air[mg/l]	Water[mg/l]	Soil[mg/kg]	Sediment[mg/kg]
MNSEM	1.0E 08	2.5E 06	9.3E 04	1.2E 03
CHEMCAN2	1.8E 07	2.9E 06	5.5E 04	8.7E 04
CHEMFRAN	1.8E 07	3.2E 06	5.9E 04	9.7E 04

Reference: EA and MITI, Japan (1993)

3.4 IDENTIFICATION OF MAIN MODE OF DEGRADABILITY IN ACTUAL USE

No studies located

3.5 BIODEGRADATION

Type:	aerobic [X]; anaerobic [ ]
Inoculum:	adapted [ ]; non-adapted [X];
Concentration of the chemical:	100 mg/l Test substance [X]
Medium:	water [X]; water sediment [ ]; soil [ ]; sewage treatment others [X] (Japanese standard activated sludge)
Degradation:	Degree of degradation after 28 days 0, 0 and 0 % from BOD 0, 0 and 0 % from GC analysis
Results:	Readily biodeg. [ ]; Inherently biodeg. [ ]; under test condition No biodegradation observed [X], Other [ ]
Method:	OECD Test Guideline 301C
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	2,4-Dichlorotoluene, purity: > 98.5 %
Remarks:	None
Reference:	MITI, Japan (1993)

3.6 BOD5,COD OR RATIO BOD5/COD

No studies located

3.7 BIOACCUMULATION

No studies located

3.8 ADDITIONAL REMARKS None

A. Sewage treatment

B. Other information

4.1 ACUTE/PROLONGED TOXICITY TO FISH

(a)

Type of test:	static [ ]; semi static [X]; flow through [ ]; other [ ]; open system [X]; closed system [ ]
Species:	Oryzias latipes
Exposure period:	96 hrs
Results:	LC50(24h)= 5.4 mg/l(95% confidence level:2.3-13 mg/l) LC50(48h)= 3.2 mg/l(95% confidence level:1.9-5.5mg/l) LC50(72h) =2.9 mg/l(95% confidence level:2.0-4.7mg/l) LC50(96h) =2.7 mg/l(95% confidence level:1.0-1.9mg/l) NOEC = LOEC =
Analytical monitoring:	Yes [ ]; No [X]; ? [ ]
Method:	OECD Test Guideline 203 (1981)
GLP:	Yes [ ]; No [X]; ? [ ]
Test substance:	2,4 Dichlorotoluene, purity = 99.8 %
Remarks:	A group of 10 fishes were exposed to 5 nominal concentrations (1.0-10 mg/l). Stock solution was prepared with Tween 80 (10 mg/l). Controls with and without this vehicle were taken for test.
Reference:	EA, Japan (1992)

(b)

Type of test:	static [ ]; semi static [ ]; flow through [ ]; other [ ]; open system [ ] closed system [ ]
Species:	Brachydanio rerio (Zebrabaerbling)
Exposure period:	96 hrs
Results:	LC0 (96h) = > 100 mg/l NOEC = LOEC =
Analytical monitoring:	Yes [ ]; No [ ]; ? [X]
Method:	
GLP:	Yes [ ]; No [ ]; ? [X]
Test substance:	2,4 Dichlorotoluene
Remarks:	
Reference:	Bayer AG

4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

A. Daphnia

(a)

Type of test:	static [X]; semi static [ ]; flow through [ ]; other [ ]; open system [X]; closed system [ ]
Species:	Daphnia magna
Exposure period:	24 hrs
Results:	EC50(24h) = 19 mg/l(95% confidence level: 15-23 mg/l) EC50(48h) =

NOEC =
LOEC =
Analytical monitoring: Yes [ ] No [X] ? [ ]
Method: OECD Test Guideline 202 (1984)
GLP: Yes [ ] No [X] ? [ ]
Test substance: 2,4 Dichlorotoluene, purity = 99.8 %
Remarks: 20 Daphnids (4 replicates; 5 organisms per replicate) were exposed to 5 nominal concentrations (10-100 mg/l). Stock solution was prepared with DMSO:HCO-40 = 9:1 (100 mg/l). Controls with and without this vehicle were taken for test.
Reference: EA, Japan (1992)

(b)
Type of test: static [X]; semi static [ ]; flow through [ ]; other [ ]; open system [ ]; closed system [ ]
Species: Daphnia magna
Exposure period: 48 hrs
Results: EC50(24h) =
EC50(48h) = 0.6 mg/l
NOEC =
LOEC =
Analytical monitoring: Yes [ ] No [ ] ? [X]
Method:
GLP: Yes [ ] No [ ] ? [X]
Test substance: 2,4 Dichlorotoluene
Remarks:
Reference: Hermeus J. et al. (1984)

B. Other aquatic organisms

No studies located

4.3 TOXICITY TO AQUATIC PLANTS e.g. Algae

Species: Selenastrum capricornutum ATCC 22662
End point: Biomass [X]; Growth rate [ ]; Other [ ]
Exposure period: 72 hrs
Results: Biomass: EC50(72h) = 9.7 mg/l
NOEC =
LOEC =
Analytical monitoring: Yes [ ] No [X] ? [ ]
Method: OECD Test Guideline 201 (1984)
open system [X]; closed system [ ]
GLP: Yes [ ] No [X] ? [ ]
Test substance: 2,4 Dichlorotoluene, purity = 99.8 %
Remarks: The EC50 values were calculated based on 5 nominal concentrations (4.8-50 mg/l). Stock solution was prepared with ethanol (100 mg/l). Controls with and without this vehicle were taken for test.

Reference: EA, Japan (1992)

4.4 TOXICITY TO BACTERIA

Type: Aquatic [ ]; Field [ ]; Soil [ ]; Other [ ]
Species: Pseudomonas putida
Exposure period: 30 min.
Results: EC0(30 min) = 125 mg/l
Analytical monitoring: Yes [ ] No [ ] ? [X]
Method: Flow through
GLP: Yes [ ] No [ ] ? [X]
Test substance: 2,4 Dichlorotoluene
Remarks:
Reference: Bayer AG (1991)

4.5 CHRONIC TOXICITY TO AQUATIC ORGANISMS

4.5.1. CHRONIC TOXICITY TO FISH

Type of test: static [ ]; semi static [ ]; flow through [ ];
other [ ];
open system [ ]; closed system [ ]
Species: Guppy (Poecilia reticulate)
End point: Length of young fish [ ]; Weight of young fish [ ];
Reproduction rate [ ]; Other [ ]
Exposure period: 14 days
Results: EC50(d) =
LC50(14d) = 4.64 mg/l
NOEC =
LOEC =
Analytical monitoring: Yes [ ] No [ ] ? [X]
Method:
GLP: Yes [ ] No [ ] ? [X]
Test substance: 2,4 Dichlorotoluene
Remarks:
Reference: Konemann, H. (1981)

4.5.2. CHRONIC TOXICITY TO AQUATIC INVERTEBRATES

(a)
Type of test: static [ ]; semi static [X]; flow through [ ];
other [ ];
open system [X]; closed system [ ]
Species: Daphnia magna
End point: Mortality [X]; Reproduction rate [X]; Other [ ]
Exposure period: 21 days
Results:

Mortality:
LC50(24h) = 11 mg/l (95% confidence level:8.6-14 mg/l)

LC50(48h) = 6.5 mg/l (95% confidence level:4.8-9.3 mg/l)
LC50(96h) = 5.0 mg/l (95% confidence level:3.6-7.2 mg/l)
LC50(7d) > 2 mg/l
LC50(14d) > 2 mg/l
LC50(21d) > 2 mg/l

Reproduction:

EC50(14d) > 2 mg/l
EC50(21d) > 2
NOEC= 2.0 mg/l ($p < 0.05$)
LOEC= 6.2 mg/l ($p < 0.05$)

Analytical monitoring: Yes [ ] No [X] ? [ ]
Method: OECD Test Guideline 202 (1984)
GLP: Yes [ ] No [X] ? [ ]
Test substance 2,4 Dichlorotoluene, purity = 99.8 %
Remarks: 40 daphnids (4 replicates; 10 organisms per replicate) were exposed to 5 nominal concentrations (0.2-20 mg/l). Stock solution was prepared with DMSO:HCO-40 = 9:1 (100 mg/l). Controls with and without this vehicle were taken for test.
The mortality of the parent daphnids on the 21st day were 100 % at the highest two concentrations of 20 and 6.5 mg/l. The mortality were consistent among the exposure levels as 17.5, 27.5 and 17.5 % at the concentrations of 2.0, 0.62 and 0.20 mg/l, respectively, then the toxic value such as LC50s(21d) was not determined. Regarding effect on reproduction the average number of offspring for a 21 days (% of the control) were 23.2 (66.7%), 27.6 (79.2%), 29.6(85.0%) and 34.8 individuals/female at the concentrations of 2.0, 0.62, 0.20 mg/l, and the control, respectively. The reduction rate (15.0-33.3 %) in those concentrations was not significant, and then the NOEC on reproduction was 2.0 mg/l, however the parent daphnids were died at 6.2 mg/l.

Reference: EA, Japan (1992)

(b)
Type of test: static [X]; semi static [ ]; flow through [ ];
other [ ];
open system [ ]; closed system [ ]
Species: Daphnia magna
End point: Mortality [ ]; Reproduction rate [ ]; Other [ ]
Exposure period: 16 days
Results: EC50(h) =
NOEC = 0.24 mg/l
LOEC =
Analytical monitoring: Yes [ ] No [ ] ? [X]
Method:
GLP: Yes [ ] No [ ] ? [X]
Test substance: 2,4 Dichlorotoluene
Remarks:
Reference: Hermens J. et al. (1984)

(c)

Type of test:	static [X]; semi static [ ]; flow through [ ]; other [ ]; open system [ ]; closed system [ ]
Species:	Daphnia magna
End point:	Mortality [ ]; Reproduction rate [ ]; Other [ ]
Exposure period:	16 days
Results:	EC50( ) = LC50(16d) = 0.84 mg/l NOEC = LOEC =
Analytical monitoring:	Yes [ ] No [ ] ? [X]
Method:	
GLP:	Yes [ ] No [ ] ? [X]
Test substance:	2,4 Dichlorotoluene
Remarks:	
Reference:	Hermens J. et al. (1984)

4.6 TOXICITY TO TERRESTRIAL ORGANISMS

4.6.1 TOXICITY TO SOIL DWELLING ORGANISMS

No studies located

4.6.2 TOXICITY TO TERRESTRIAL PLANTS

No studies located

4.6.3 TOXICITY TO OTHER NON MAMMALIAN TERRESTRIAL SPECIES (INCLUDING AVIAN)

No studies located

4.7 BIOLOGICAL EFFECTS MONITORING (INCLUDING BIOMAGNIFICATION)

No studies located

4.8 BIOTRANSFORMATION AND KINETICS IN ENVIRONMENTAL SPECIES

No studies located

4.9 ADDITIONAL REMARKS

None

5.1 ACUTE TOXICITY

5.1.1 ACUTE ORAL TOXICITY

(a)

Type :	LD0 [ ]; LD100 [ ]; LD 50 [X]; LDL0 [ ]; Other [ ]
Species/strain:	Rat
Value :	> 2000 (mg/kg):
Method:	OECD Test Guideline 410
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	2,4-Dichlorotoluene, purity: 98.96 %
Remarks:	None
Reference:	MHW, Japan (1993a)

(b)

Type :	LD0 [ ]; LD100 [ ]; LD 50 [X]; LDL0 [ ]; Other [ ]
Species/strain:	Rat
Value :	= 4600 (mg/kg):
Method:	Unknown
GLP:	Yes [ ] No [ ] ? [X]
Test substance:	2,4-Dichlorotoluene, purity: unknown
Remarks:	None
Reference:	Unpublished company data

(c)

Type :	LD0 [ ]; LD100 [ ]; LD 50 [X]; LDL0 [ ]; Other [ ]
Species/strain:	Rat
Value :	= 2790 (mg/kg):
Method:	Unknown
GLP:	Yes [ ] No [ ] ? [X]
Test substance:	2,4-Dichlorotoluene, purity: unknown
Remarks:	None
Reference:	Bayer AG (1981)

(d)

Type :	LD0 [ ]; LD100 [ ]; LD 50 [X]; LDL0 [ ]; Other [ ]
Species/strain:	Mouse
Value :	= 2900 (mg/kg):
Method:	Unknown
GLP:	Yes [ ] No [ ] ? [X]
Test substance:	2,4-Dichlorotoluene, purity: unknown
Remarks:	None
Reference:	Unpublished company data

5.1.2 ACUTE INHALATION TOXICITY

Type :	LC0 [ ]; LC100 [ ]; LC50 [X]; LCL0 [ ]; Other [ ]
Species/strain:	Rat
Exposure time:	4h
Value:	> 2669 mg/4h

Method:	Unknown
GLP:	Yes [ ] No [ ] ? [X]
Test substance:	2,4-Dichlorotoluene, purity: unknown
Remarks:	None
Reference:	Bayer AG (1989)

5.1.3 ACUTE DERMAL TOXICITY

No studies located

5.1.4 ACUTE TOXICITY, OTHER ROUTES OF ADMINISTRATION

No studies located

5.2 CORROSIVENESS/IRRITATION

5.2.1 SKIN IRRITATION/CORROSION

Species/strain:	Rabbit
Results:	Highly corrosive [ ]; Corrosive [ ]; Highly irritating [ ]; Irritating [ ]; Moderate irritating [X]; Slightly irritating [ ]; Not irritating [ ]
Classification:	Highly corrosive (causes severe burns)[ ]; Corrosive caused burns) [ ]; Irritating [X]; Not irritating [ ]
Method:	Patch test according to "Code of Federal Regulations, Title 16, Section 1500.41"
GLP:	Yes [ ] No [ ] ? [X]
Test substance:	2,4-Dichlorotoluene
Remarks:	
Reference:	Bayer AG

5.2.2 EYE IRRITATION/CORROSION

Species/strain:	Rabbit
Results:	Highly corrosive [ ]; Corrosive [ ]; Highly irritating [ ]; Irritating [ ]; Moderate irritating [ ]; Slightly irritating [ ]; Not irritating [X]
Classification:	Irritating [ ]; Not irritating [X]; Risk of serious damage to eyes [ ]
Method:	Patch test according to "Code of Federal Regulations, Title 16, Section 1500.41"
GLP:	Yes [ ] No [ ] ? [X]
Test substance:	2,4-Dichlorotoluene
Remarks:	
Reference:	Bayer AG

5.3 SKIN SENSITISATION

No studies located

5.4 REPEATED DOSE TOXICITY

Species/strain:	Rat (Crj:CD(SD))
Sex:	Female [ ]; Male [ ]; Male/Female [X]; No data [ ]
Route of Administration:	oral gavage
Exposure period:	Male: 46 days including 14 days before mating Female: from 14 days before mating to day 3 of lactation
Frequency of treatment:	7 days/week
Post exposure observation period:	
Dose:	0, 12.5, 79 or 500 mg/kg (12 animals /group)
Control group:	Yes [X]; No [ ]; No data [ ]; Concurrent no treatment [ ]; Concurrent vehicle [X]; Historical [ ]
NOEL:	< 12.5 mg/kg/day
LOEL:	12.5 mg/kg/day
Results:	Dose dependent salivation was noted immediately after administration in all treated groups. Decrease in body weight gain were noted in the females of the 500 mg/kg group at the gestation and lactation periods. In food consumption, decreases were noted in both sexes of the 500 mg/kg groups. In hematological and blood chemical examinations, decreases in platelet count, alfa-globulin fraction, triglyceride and blood urea nitrogen, and increase in cholinesterase were noted in the 500 mg/kg male group. In organ weights of the 500 mg/kg group, increased relative liver weights in both sexes, and of the relative kidney weights in the males were noted. In autopsy, dark brown discoloration of the liver was noted in 500 mg/kg male group. In histopathological examination of the liver, centrilobular swelling of hepatocytes was noted in all males of the 500 mg/kg group and 2 males of the 79 mg/kg group. In kidney, atrophy and regeneration of tubular epitherium, and dilation of tubules were noted in 79 mg/kg or more groups. In addition, the number of the males with hyalin droplets and eosinophilic depositions in tubular epitherium increased progressively in the groups of 79 and 500 mg/kg. On the basis of above-mentioned, NOEL of this compound was indicated less than 12.5 mg/kg/day.
Method:	OECD Combined Repeat dose and Reproductive/Developmental Screening Toxicity Test (1992)
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	Commercial, purity: 98.96 %
Reference:	MHW, Japan (1993b)

5.5 GENETIC TOXICITY IN VITRO

A. BACTERIAL TEST

Type :	Bacterial reverse mutation assay
System of testing:	Species/strain: S. typhimurium TA 98, TA 100, TA 1535, TA 1537, TA 1538 E. Coli uvrA
Concentration:	0, 15.625 - 1000 µg/plate
Metabolic activation:	With [ ]; Without [ ]; With and Without [X]; No data [ ]

Results:
Cytotoxicity conc: With metabolic activation: 1000 µg/plate
Without metabolic activation: 500 µg/plate
Precipitation conc: µg/plate
Genotoxic effects: + ? -
With metabolic activation: [ ] [ ] [X]
Without metabolic activation: [ ] [ ] [X]
Method: Japanese Guideline for Screening Mutagenicity testing of chemicals
GLP: Yes [X] No [ ] ? [ ]
Teat substance: Commercial, purity: 98.96 %
Remarks: Procedure: Plate method
Plates/test: 3
Activation system: Liver S-9 fraction from Phenobarbital and 5,6-Benzoflavone Pretreated male SD rats with NADPH-generating system
Media:Histidine selective
No. replicates: 2
Reference: MHW, Japan (1993c)

B. NON BACTERIAL IN VITRO TEST

Type : Cytogenetics Assay
System of testing: Species/strain: Chinese hamster CHL cells
Concentration: Incubated with 0, 17.5 - 70.0 µg/ml (-S9)
0, 22.5 - 90.0 µg/ml (+S9)
Metabolic activation: With [ ]; Without [ ]; With and Without [X]; No data [ ]
Results:
Cytotoxicity conc: With metabolic activation: 90 µg/plate
Without metabolic activation: 70 µg/plate
Precipitation conc:
Genotoxic effects: + ? -
With metabolic activation: [ ] [ ] [X]
Without metabolic activation: [ ] [ ] [X]
Method: Japanese Guideline for Screening Mutagenicity of chemicals
GLP: Yes [X] No [ ] ? [ ]
Test substance: Commercial, purity %
Remarks: Plates/test:2
Activation system: S-9 fraction from the liver of Phenobarbital and 5,6-Benzoflavone induced male SD derived rats with NADPH-generating system
No. replicates: 1
Reference: MHW, Japan (1993c)

5.6 GENETIC TOXICITY IN VIVO

No studies located

5.7 CARCINOGENICITY

No studies located

5.8 TOXICITY TO REPRODUCTION

Type:	Fertility [ ]; One generation study [ ]; Two generation study [ ]; Other [X]
Species/strain:	Rat slc:SD
Sex:	Female [ ]; Male [ ]; Male/Female [X]; No data [ ]
Route of Administration: oral gavage	
Exposure period:	Males: 46 days including 14 days before mating Females: from 14 days before mating to day 3 of lactation.
Frequency of treatment: 7 day /week	
Postexposure observation period:	
Premating exposure period: male: 14 days; female: 14 days	
Duration of the test;	
Doses:	0, 12.5, 79, or 500 mg/kg (12 /animals/sex/group)
Control group:	Yes [X]; No [ ]; No data [ ]; Concurrent no treatment [ ]; Concurrent vehicle [X]; Historical [ ]
NOEL Parental :	79 mg/kg/day
NOEL F1 Offspring:	79 mg/kg/day
NOEL F2 Offspring:	N/A
Results:	In reproductive ability test, all pairs in the 12.5 and 79 mg/kg groups achieved pregnancy. In the 500 mg/kg group, 12 pairs showed evidence of copulation with a sperm positive vaginal smear, however, only 5 pairs out of them achieved pregnancy. In six non-pregnant pairs in the 500 mg/kg group, vaginal plugs were not noted or a few sperm were found in the vaginal smears. These results suggested that the male reproductive organs and secondary reproductive organs had functional disorder. In body weight changes of pups, decreases in liver and body weights were noted in the 500 mg/kg group on day 1 of lactation. In delivery or lactating behavior of dams, viability, general appearance or autopsy of pups, no effects of this chemical administration was noted. On the basis of above-mentioned, NOEL of the reproductive/developmental toxicity for both sexes was considered to be 79 mg/kg/day.
Method:	Combined Repeated Dose and Reproductive/Developmental Toxicity Screening Test
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	Commercial, purity 98.96 %
Remarks:	
Reference:	MHW, Japan (1993b)

5.9 DEVELOPMENTAL TOXICITY/ TERATOGENICITY

No studies located

5.10 OTHER RELEVANT INFORMATION

A. Specific toxicities

No studies located

B. Toxicodynamics, toxicokinetics

No studies located

5.11 EXPERIENCE WITH HUMAN EXPOSURE

None

Aldrich: Catalog Handbook of Fine Chemicals

Bayer AG Unpublished report

Bayer AG (1981) Unpublished report

Bayer AG (1990) Unpublished report

EA, Japan (1983) Environment Monitoring of Chemicals Environmental Survey Report of F.Y. 1980 and 1981 (Office of Health Studies, Environmental Health Department, EA, Japan)

EA, Japan (1992) "Investigation of the Ecotoxicological Effects of OECD High Production Volume Chemicals", Office of Health Studies, Environmental Health Department, Environment Agency, Japan (HPV/SIDS Test conducted by EA, Japan)

EA and MITI, Japan (1993) Unpublished Report on Exposure Estimation (HPV/SIDS Test conducted by EA and MITI, Japan)

Encyclopedia Chimica, 4, 227

Hermens J. et al. (1984) Aquat. toxicol., 5, 143 154

Konemann H. (1981) Toxicology 19, 209 221

Lyman, W.J., W. F. Reehl and D. H. Rosenblatt (1981) "Handbook of Chemical Property Estimation Method", McGraw Hill Book Co.

MHW, Japan (1993a) Unpublished Report on Acute Toxicity Test of 2,4-Dichlorotoluene. (HPV/SIDS Test conducted by MHW, Japan)

MHW, Japan (1993b) Unpublished Report on Combined Repeat Dose and Reproductive/Developmental Toxicity Screening Test of 2,4-Dichlorotoluene. (HPV/SIDS Test conducted by MHW, Japan)

MHW, Japan (1993c) Unpublished Report on Mutagenicity Test of 2,4-Dichlorotoluene. (HPV/SIDS Test conducted by MHW, Japan)

MITI, Japan: Unpublished data

MITI, Japan (1993): Unpublished Report (1993) (HPV/SIDS Test conducted by MITI, Japan. Test was performed in Chemicals Inspection and Testing Institute, Japan)

Zoeteman B.C.J. et al. (1980) Chemosphere 9, 231