

[FOREWORD](#)

[INTRODUCTION](#)

TRIPROPYLENE GLYCOL

CAS N°: 24800-440

SIDS Initial Assessment Report
for
SIAM 2
(Paris, 4-6 July 1994)

Chemical Name : Tripropylene glycol

CAS No: 24800-44-0

Sponsor Country: Japan

National SIDS Contact Point in Sponsor Country:

Mr. Yasuhisa Kawamura, Ministry of Foreign Affairs, Japan

History: As a high priority chemical for initial assessment, tripropylene glycol was selected in the framework of the HPV Programme.
At SIAM-2, conclusion was approved with comments.
Comments at SIAM-2: Rearrangement of the documents.

Deadline for circulation:

Date of Circulation:

SIDS INITIAL ASSESSMENT PROFILE

CAS No.	24800-44-0
Chemical Name	Tripropylene glycol
Structural Formula	HO[CH(CH ₃)CH ₂ O] ₃ H

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

Tripropylene glycol is a stable liquid with a production volume of ca. 600 tonnes/year in 1990 - 1993 in Japan. This chemical is used as an intermediate for resins in closed systems. It is stable in neutral and acidic solutions, 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 estimated concentrations were 9.7×10^{-11} mg/l (air), 8.3×10^{-6} mg/l (water), 3.0×10^{-5} mg/kg (soil), 5.0×10^{-5} mg/kg (sediment).

For the environment, various NOEC and LC₅₀ values were gained from test results; LC₅₀ = > 1,000 mg/l (acute fish); EC₅₀ = > 1,000 mg/l (acute daphnia); EC₅₀ = > 1,000 mg/l (acute algae); NOEC = > 1,000 mg/l (long-term daphnia reproduction). Therefore, the chemical does not have any remarkable ecotoxicity. Based on these values and considering the test duration the PNEC for aquatic organisms has been calculated as more than 10 mg/l.

The chemical does not have any remarkable ecotoxicity and its PEC/PNEC ratio is less than 1. Therefore, it is considered to be of low risk for the environment.

No monitoring data at work place have been available. Since the chemical is used as an intermediate in a closed system no data for consumer use are available.

Based on the physico-chemical properties, the level exposed indirectly through the environment was estimated as 5.9×10^{-5} mg/man/day. Also, the daily intake through drinking water is estimated as 2.8×10^{-7} mg/kg/day and through fish is calculated as 2.1×10^{-8} mg/kg/day. No data on occupational exposure are available. Neither monitoring data at work place nor data on consumer exposure have been reported.

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

In a combined repeat dose and reproductive/developmental toxicity screening test, only salivation was observed at the highest dose (1000 mg/kg/day).

Also, increase in liver and kidney weights were observed in parental animals at that dose. From the view point of reproductive/developmental end-points, there were no effects observed related to mating, fertility and oestrus cycle and also for dams during the pregnancy and lactation period and for pups after their birth. Therefore, NOEL was 200 mg/kg/day for repeated dose toxicity as well as more than 1000 mg/kg/day for reproductive toxicity.

For human health, NOEL was estimated as 200 mg/kg/day and 1000 mg/kg/day for repeated dose and reproductive toxicity, respectively. The total exposed dose indirectly through the environment was estimated as 5.9×10^{-8} mg/man/day. Also, the daily intake through drinking water is estimated as 2.8×10^{-7} mg/kg/day and through fish is calculated as 2.1×10^{-8} mg/kg/day. For human health, margins of safety by indirect exposure from fish or drinking water are very large. Therefore, health risk is presumably low.

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: 24800-44-0	SPECIES	PROTOCOL	RESULTS
PHYSICAL-CHEMICAL			
2.1 Melting Point		Unknown	< -10 °C
2.2 Boiling Point		Unknown	267 °C at 1,013 hPa
2.3 Density		Unknown	6.6
2.4 Vapour Pressure		OECD TG 104	140 Pa at 25 °C
2.5 Partition Coefficient (Log Pow)		OECD TG 107	0.5 – 0.6 at 25 °C
2.6 A. Water Solubility		Unknown	Miscible at 25 °C
B. pH			No data available.
pKa			No data available
2.12 Oxidation: Reduction Potential			No data available.
ENVIRONMENTAL FATE AND PATHWAY			
3.1.1 Photodegradation			No degradation
3.1.2 Stability in Water		OECD TG 111	Stable at pH 4.0, 7.0, 9.0
3.2 Monitoring Data			No data available
3.3 Transport and Distribution		Calculated (MNSEM model)	In Air 9.7E-11 mg/l In Water 8.3E-06 mg/l In Soil 3.0E-05 mg/kg In Sediment 5.0E-05 mg/kg
3.5 Biodegradation		OECD TG 301C	Not readily biodegradable: 1-2 % (BOD), 0 % (TOC), 0-3 % (GC) in 28 days
3.6 Bioaccumulation			No data available
ECOTOXICOLOGY			
4.1 Acute/Prolonged Toxicity to Fish	<i>Oryzias latipes</i>	OECD TG 203	LC ₅₀ (24hr): > 1,000 mg/L LC ₅₀ (96hr): > 1,000 mg/L
4.2 Acute Toxicity to Aquatic Invertebrates (<i>Daphnia</i>)	<i>Daphnia magna</i>	OECD TG 202	EC ₅₀ (24hr): > 1,000 mg/l
4.3 Toxicity to Aquatic Plants e.g. Algae	<i>Selenastrum capricornutum</i>	OECD TG 201	EC ₅₀ (72hr): > 1,000 mg/l NOEC: > 1,000 mg/l
4.5.2 Chronic Toxicity to Aquatic Invertebrates (<i>Daphnia</i>)	<i>Daphnia magna</i>	OECD TG 202	EC ₅₀ (21d, Immobility): >1,000 mg/l EC ₅₀ (21d, Reproduction) >1,000 mg/l NOEC (21d, Reproduction) >1,000 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: 24800-44-0	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 : > 2,000 mg/kg
5.1.2 Acute Inhalation Toxicity			No data available.
5.1.3 Acute Dermal Toxicity			No data available
5.4 Repeated Dose Toxicity	Rat	OECD Combined Test	NOEL = 200 mg/kg/day
5.5 Genetic Toxicity In Vitro			
A. Bacterial Test (Gene mutation)	<i>S. typhimurium</i> <i>E. coli</i>	OECD Guidelines No.471 and 472 and Japanese Guideline	Negative in all bacterial strains with and without metabolic activation.
B. Non-Bacterial In Vitro Test (Chromosomal aberrations)	CHL cells	OECD Guideline No.473 and Japanese Guideline	Negative with metabolic activation and without metabolic activation
5.6 Genetic Toxicity In Vivo			No data available
5.8 Toxicity to Reproduction	Rat	OECD Combined Test	NOEL Parental = 1,000 mg/kg/day NOEL F1 offspring = 1,000 mg/kg/day
5.9 Developmental Toxicity/ Teratogenicity			
5.11 Experience with Human Exposure			

SIDS Initial Assessment Report

1. Identity

OECD Name:	Tripropylene glycol
Synonym:	
CAS Number:	24800-44-0
Empirical Formula:	C ₉ H ₂₀ O ₄
Structural Formula:	HO[CH(CH ₃)CH ₂ O] ₃ H
Degree of Purity:	> 98 %
Major Impurities:	Dipropylene glycol
Essential Additives:	No additives

2. Exposure

2.1 General discussion

Tripropylene glycol is a stable liquid with a production volume of ca. 600 tonnes/year from 1990 - 1993 in Japan. It is used as an intermediate for resins in closed system. All wastes are incinerated. Tripropylene glycol seems to be released into water and air from its production sites after biological treatment. No specific monitoring data of the chemical is available.

This chemical is stable in neutral, acidic and alkaline solutions, and is considered as “not readily biodegradable”.

2.2 Environmental exposure

a) Biodegradability:

If released into water, this substance is not readily biodegraded (MITI (I), corresponding to the OECD

301C: 1-2 % during 28 days based on BOD, 0 % based on TOC and 0 - 3 % based on GC analysis).

b) Hydrolysis as a function to pH:

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

c) Photodegradability (estimation)

No degradation is expected, because of lack of UV absorption.

d) Bioaccumulation:

No data are available.

e) Estimates of environmental fate, pathway and concentration:

The potential environmental distribution of tripropylene glycol obtained from a generic fugacity model, Mackay level III, under emission scenarios is shown in Table I. The results show that when 1,4 is released into water, the majority of the chemical is likely distributed into soil and sediment

PECs have been calculated based on several models (MNSEM, CHEMCAN, CHEMFRN) considering its physico-chemical properties (e.g. molecular weight, water solubility, vapour pressure and partition coefficient). The estimated concentrations of MNSEM model were 9.7×10^{-11} mg/l (air), 8.3×10^{-6} mg/l (water), 3.0×10^{-5} mg/kg (soil), 5.0×10^{-5} mg/kg (sediment). PEC_{global} was also calculated as 6.0×10^{-8} mg/l, based on a default scenario. No monitoring data at work place and environment have been reported. The chemical is used in closed system, and no data for consumer use are available. Based on the physico-chemical properties, the total exposure from the environment was estimated as 5.9×10^{-5} mg/man/day. Also, the daily intake through drinking water is estimated at 1.7×10^{-5} mg/kg/day and through fish it is calculated as 1.3×10^{-6} mg/kg/day.

Global situation:

Method: MNSEM 147S (Details are shown in Form-1 Annex)

Input data:

Molecular weight: 192.26
 Water solubility: 1000000 [mg/l]
 Vapor pressure: 1.05E+00 [mmHg]
 Log Pow: 0.60

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

Air: 9.7E-11 [mg/l]
 Water: 8.3E-06 [mg/l]
 Soil: 3.0E-05 [mg/kg dry solid]
 Sediment: 5.0E-05 [mg/kg dry solid]

Exposure dose

Inhalation of air: 2.0E-06 [mg/day]
 Drinking water: 1.7E-05 [mg/day]
 Ingestion of fish: 1.3E-06 [mg/day]
 meat: 2.4E-11 [mg/day]
 milk: 3.5E-11 [mg/day]
 vegetation: 3.9E-05 [mg/day]

Total exposure dose: 5.9E-05 [mg/day]

Table 1. Comparison of calculated environmental concentration of tripropylene glycol using several models.

Model	Air[mg/l]	Water[mg/l]	Soil[mg/kg]	Sediment[mg/kg]
MNSEM	9.7E-11	8.3E-06	3.0E-05	5.0E-05
CHEMCAN2	1.6E-10	8.5E-06	1.4E-06	8.4E-06
CHEMFRAN	1.7E-11	8.5E-06	1.1E-07	8.4E-07

2.3 Consumer Exposure

No data on consumer exposure are available.

2.4 Occupational Exposure

No data on work place monitoring have been reported.

3. Toxicity

3.1 Human Toxicity

a) Acute toxicity

LD₅₀ was 3,000 mg/kg in acute oral toxicity studies in rats. LD₅₀ and LC₅₀ values in acute inhalation and dermal toxicity study are not available.

b) Repeated toxicity

There is only one key study on repeated dose toxicity of tripropylene glycol. 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 regard as a key study. Male and female SD rats were orally administered (gavage) at doses of 0, 8, 40, 200 and 1,000 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 mating period. In female, in addition to maximum four weeks pre-mating and mating period, they were given through pregnant period until day 3 of post delivery.

In the clinical observation, salivation was observed in the 1,000 mg/kg male group. There were no differences in body weight gain, food consumption, clinical chemistry, or hematological parameters between the treated and control animals of both sexes. Increased absolute and relative liver weights, and increased relative kidney weight occurred in 1,000 mg/kg/day in males. Also, increased relative liver weight was observed in 1,000 mg/kg/day female group. In histopathological examinations, any changes which may have been caused by the test substance were not observed in the heart, kidneys, liver, thymus, testes, ovaries, epididymides, adrenal, brain or spleen in both sexes. The NOEL is considered to be 200 mg/kg/day for repeated dose toxicity.

c) Reproductive toxicity

Tripropylene glycol 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, 8, 40, 200 and 1,000 mg/kg/day. Although this combined study was designed to investigate reproductive capability in parental generation as well as development in F₁ 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.

There were no effects on mating, fertility, and oestrus cycle or on dams during the pregnancy and lactation period. External examination of pups revealed no increase in appearance of abnormal pups. Body weight gain of pups was normal. Pups killed at postnatal day 4 showed no abnormal gross findings. The NOEL values for both parental and F₁ offspring in reproductive toxicity are considered to be 1,000 mg/kg/day.

d) Genetic toxicity

Bacterial test

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 pre-incubation method. This study was well controlled and regarded as a key study.

Trippropylene glycol showed negative results in *Salmonella typhimurium* TA100, TA1535, TA98, TA1537 and *Escherichia coli* WP2 *uvrA* at concentrations up to 5 mg/plate with or without metabolic activation system (MHW, 1993).

Non-bacterial test *in vitro*

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 with no apparent cytotoxic effect in continuous treatment. In short term treatment, it was set to 3.5 mg/ml because the concentration was equivalent to ca. 10 mM as required in test guidelines. Either structural chromosomal aberrations or polyploidy were not recognized up to a maximum concentration of 1.90 mg/ml under conditions of both continuous treatment and short-term treatment with or without an exogenous metabolic activation system (MHW, 1993).

in vivo test

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

e) Other human health related information

None

3.2 Ecotoxicity

Trippropylene glycol 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, 204 and 211]. Acute and chronic toxicity data to test organisms for docosanoic acid are summarized in Table 2. No other ecotoxicological data are available. Various NOEC and LC₅₀ values were gained from above tests; 96h LC₅₀ = > 1,000 mg/l (acute fish); 24h EC₅₀ = > 1,000 mg/l (acute daphnia); 72h EC₅₀ = > 1,000 mg/l (acute algae); 21d NOEC = > 1,000 mg/l (long-term daphnia reproduction). Therefore, the chemical is considered to be non-toxic to fish, daphnids and algae and it does not have any remarkable ecotoxicity. Based on these values and considering the test duration, PNEC for aquatic organisms has been calculated as more than 10 mg/l. Environmental risk is presumably low.

Table 2. Acute and chronic toxicity data of tripropylene glycol to aquatic organisms.

Species	Endpoint ^{*1}	Conc. (mg/L)	Reference
<i>Selenastrum capricornutum</i> (algae)	Biomass: EC ₅₀ (72h)	> 1,000 mg/L	MOE, Japan. (1992)
<i>Daphnia magna</i> (water flea)	Mor: LC ₅₀ (24h) Rep: EC ₅₀ (21d) NOEC(21d)	> 1,000 mg/L > 1,000 mg/L > 1,000 mg/L	
<i>Oryzias latipes</i> (fish, Medaka)	Mor: LC ₅₀ (24h) Mor: LC ₀ (72h) Mor:LC50(96h)	> 1,000 mg/L > 1,000 mg/L > 1,000 mg/L	

Notes: ^{*1} Mor; mortality, Rep; reproduction.

4. Initial assessment

Tripropylene glycol is stable liquid and the production volume is ca. 600 tonnes/year in 1990 - 1993 in Japan. This chemical is used as an intermediate for resins in closed system. This chemical is stable in neutral and acidic solutions, 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 estimated concentrations were 9.7×10^{-11} mg/l (air), 8.3×10^{-6} mg/l (water), 3.0×10^{-5} mg/kg (soil), 5.0×10^{-5} mg/kg (sediment). No monitoring data at work place have been available. Since the chemical is used as an intermediate in closed system there is no data for consumer use.

Based on the physico-chemical properties, the level exposed indirectly through the environment was estimated as 5.9×10^{-5} mg/man/day. Also, the daily intake through drinking water is estimated as 2.8×10^{-7} mg/kg/day and through fish is calculated as 2.1×10^{-8} mg/kg/day. No data on occupational exposure are available. Neither monitoring data at work place nor data on consumer exposure have been reported.

For the environment, various NOEC and LC₅₀ values were gained from test results; 96h LC₅₀ = > 1,000 mg/l (acute fish); 24h EC₅₀ = > 1,000 mg/l (acute daphnia); 72h EC₅₀ = > 1,000 mg/l (acute algae); 21d NOEC = > 1,000 mg/l (long-term daphnia reproduction). Therefore, the chemical does not have any remarkable ecotoxicity. Based on these values and considering the test duration, PNEC for aquatic organisms has been calculated as more than 10 mg/l. The PEC/PNEC ratio is less than 1 Therefore it is considered to be low risk for the environment.

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

In a combined repeat dose and reproductive/developmental toxicity test, only salivation was observed at the highest dose (1000 mg/kg/day). Also, increase of liver and kidney weights were observed in parental animals at the dose. From the view point of reproductive/developmental end-points, there were no effects observed related to mating, fertility and oestrus cycle and also for dams during the pregnancy and lactation period and for pups after their birth. Therefore, NOEL was 200 mg/kg/day for repeated dose toxicity as well as more than 1000 mg/kg/day for reproductive toxicity.

The total exposed dose indirectly through the environment was estimated as 5.9×10^{-8} mg/man/day.

Also, the daily intake through drinking water is estimated as 2.8×10^{-7} mg/kg/day and through fish is calculated as 2.1×10^{-8} mg/kg/day. For human health the margin of safety by indirect exposure from fish or drinking water are very large. Therefore, health risk is presumably low.

5. Overall recommendation and initial assessment**5.1 Conclusion**

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

5.2 Recommendation

None

6. REFERENCES

EA, Japan (1992) "Investigation on 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)

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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 Tripropylene glycol (HPV/SIDS Test conducted by MHW, Japan)

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

MHW, Japan (1993c) Unpublished Report on Mutagenicity Test of Tripropylene glycol. (HPV/SIDS Test conducted by MHW, Japan)

MITI, Japan : Unpublished data

MITI, Japan (1993) Unpublished Report (Test was performed in Chemicals Inspection and Testing Institute, Japan)

Sax, N.I. (1968) Dangerous Properties of Industrial Materials, 3rd Ed., Reinhold Book Corporation, New York

SIDS DOSSIER
(Tripropylene glycol CAS No.: 24800-44-0)

Sponsor Country: Japan

S I D S P R O F I L E

1.01 A.	CAS No.	24800-44-0
1.01 C.	CHEMICAL NAME (OECD Name)	Tripropylene glycol
1.01 D.	CAS DESCRIPTOR	Not applicable
1.01 G.	STRUCTURAL FORMULA	C ₉ H ₂₀ O ₄
	OTHER CHEMICAL IDENTITY INFORMATION	HO[CH(CH ₃)CH ₂ O] ₃ H
1.5	QUANTITY	In Japan, approx 600 tonnes in 1990 – 1993.
1.7	USE PATTERN	(a) Intermediate for resin 99 %
1.9	SOURCES AND LEVELS OF EXPOSURE	<ol style="list-style-type: none"> 1. Media of release: Water from a production site Quantities per media: Negligible small 2. Media of release: Air from a production site Quantities per media: Negligible small 3. Information on consumer exposure is not available.
	ISSUES FOR DISCUSSION (IDENTIFY, IF ANY)	

SIDS SUMMARY

CAS NO: 24800-44-0		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	Y	N	N	Y	N	Y	N
	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	N						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	N						N
5.1.3	Acute Dermal	N						N
5.4	Repeated Dose	N						Y
5.5	Genetic Toxicity <i>in vitro</i>							
	. Gene mutation	N						Y
	. Chromosomal aberration	N						Y
5.6	Genetic Toxicity <i>in vivo</i>	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. GENERAL INFORMATION**1.01 SUBSTANCE INFORMATION**

- A. CAS-Number** 24800-44-0
- B. Name (IUPAC name)** Tripropylene glycol
- C. Name (OECD name)** Propanol, (1-methyl-1,2-ethanediyl)bis(oxy)bis-
- D. CAS Descriptor** Not applicable
- E. EINECS-Number** 246-466-0
- F. Molecular Formula** C₉H₂₀O₄
- G. Structural Formula**
- HO[CH(CH₃)CH₂O]₃H
- H. Substance Group** Not applicable
- I. Substance Remark**
- J. Molecular Weight** 192.26

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 %
- 1.2 SYNONYMS** [(Methylethylene)bis(oxy)]dipropanol
- 1.3 IMPURITIES** Dipropylene glycol (1 - 1.05 %), Water (0.1 - 0.5 %)
- 1.4 ADDITIVES** None
- 1.5 QUANTITY**
- | Location | Production(tonnes) | Date |
|----------|--------------------|-----------|
| Japan | 600 | 1990-1993 |
- Reference: MITI, Japan
- 1.6 LABELLING AND CLASSIFICATION**
- Labelling None
- Classification None
- 1.7 USE PATTERN**
- A. General**
- | | |
|---------------------|------------------------|
| Type of Use: | Category: |
| Main industry use | Intermediate for resin |
| MITI, Japan | 99 % |
- B. Uses in Consumer Products** None
- 1.8 OCCUPATIONAL EXPOSURE LIMIT VALUE**
- | | | |
|-------------|-------------------|----------------------|
| Source | Number of workers | Frequency & duration |
| Maintenance | 2 | 1 time/year |
| Filling | 2 | 6 days/month |
- 1.9 SOURCES OF EXPOSURE**
- (a)
- Source: Media of release: Water from a production site
Quantities per media: Negligible small

(b)

Source: Media of release: Air from a production site
Quantities per media: Negligible small

Reference: MITI, Japan

1.10 ADDITIONAL REMARKS**A. Options for disposal**

Incineration

B. Other remarks

None

2. PHYSICAL-CHEMICAL DATA**2.1 MELTING POINT**

Value: < -10 °C
 Decomposition: Yes No Ambiguous
 Sublimation: Yes No Ambiguous
 Method: Unknown
 GLP: Yes No ?
 Remarks: None
 Reference: Unpublished company data

2.2 BOILING POINT

Value: 267 °C
 Pressure: 1013 hPa
 Decomposition: Yes No Ambiguous
 Method: Unknown
 GLP: Yes No ?
 Remarks: None
 Reference: Sax, N.I. (1968)

2.3 DENSITY (Relative density)

Type: Bulk density ; Density ; Relative Density
 Value: 6.6
 Temperature:
 Method: Unknown
 GLP: Yes No ?
 Remarks:
 Reference: ECDIN database

2.4 VAPOUR PRESSURE

Value: 140 Pa
 Temperature: 25 °C
 Method: calculated ; measured
 OECD Test Guideline 104 (Static Method)
 GLP: Yes No ?
 Remarks:
 Reference: MITI, Japan (1993)

2.5 PARTITION COEFFICIENT $\log_{10}P_{ow}$

Log Pow: 0.5 - 0.6
 Temperature: 25 °C
 Method: calculated ; measured
 OECD Test Guideline 117
 GLP: Yes No ?

Remarks: None
Reference: MITI, Japan (1993)

2.6 WATER SOLUBILITY

A. Solubility

(a) Preferred result

Value: Freely soluble
Temperature: 25 °C
Description: Miscible[**X**]; Of very high solubility [];
Of high solubility []; Soluble []; Slightly soluble [];
Of low solubility []; Of very low solubility [];
Not soluble []
Method: Unknown
GLP: Yes [] No [] ? [**X**]
Remarks: Unknown
Reference: Unpublished company data

B. pH Value, pKa Value Not applicable

2.7 FLASH POINT

Value: 142 °C
Type of test: Closed cup []; Open cup [**X**]; Other []
Method: Unknown
GLP: Yes [] No [] ? [**X**]
Remarks:
Reference: Unpublished company data

2.8 AUTO FLAMMABILITY

No studies located

2.9 FLAMMABILITY

No studies located

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

None

3. ENVIRONMENTAL FATE AND PATHWAYS**3.1 STABILITY****3.1.1 PHOTODEGRADATION**

Type: Air []; Water [X]; Soil []; Other []
 Light source: Sun light [X]; Xenon lamp []; Other []
 Results: No degradation (No absorption)
 Half-life: Infinite

Reference Lyman, et al. (1981)

3.1.2 STABILITY IN WATER

Type: Abiotic (hydrolysis) [X]; biotic (sediment)[]
 Half life: Stable at pH 4, 7 and 9 at 25 °C
 Method: OECD Test Guideline 111
 GLP: Yes [X] No [] ? []
 Test substance: Tripropylene glycol
 Remarks: None
 Reference: MITI, Unpublished Report (1993) (Test was performed in
 Chemicals Inspection and Testing Institute, Japan)

3.1.3 STABILITY IN SOIL

No studies located

3.2 MONITORING DATA (ENVIRONMENT)

No studies located

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:	9.7E-11 [mg/l]
Water:	8.3E-06 [mg/l]
Soil:	3.0E-05 [mg/kg dry solid]
Sediment:	5.0E-05 [mg/kg dry solid]

Exposure dose

Inhalation of air:	2.0E-06 [mg/day]
Drinking water:	1.7E-05 [mg/day]
Ingestion of fish:	1.3E-06 [mg/day]
meat:	2.4E-11 [mg/day]
milk:	3.5E-11 [mg/day]
vegetation:	3.9E-05 [mg/day]

Total exposure dose: 5.9E-05 [mg/day]

Remarks: Input data:

Molecular weight:	192.26
Water solubility:	1000000 [mg/l]
Vapor pressure:	1.05E+00 [mmHg]
Log Pow:	0.60

MNSEM 147S is a slightly revised version of MNSEM 145I.
addition of air particle compartment to air phase
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	9.7E-11	8.3E-06	3.0E-05	5.0E-05
CHEMCAN2	1.6E-10	8.5E-06	1.4E-06	8.4E-06
CHEMFRAN	1.7E-11	8.5E-06	1.1E-07	8.4E-07

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 related to COD []; DOC []; Test substance [X];
Medium:	water []; water-sediment []; soil []; sewage treatment others [X] (Japanese standard activated sludge)
Degradation:	Degree of degradation after 28 days 1, 2 and 2 % from BOD 0, 0 and 0 % from TOC analysis 0, 3 and 3 % from GC analysis

Results: Readily biodeg. ; Inherently biodeg. ; under test condition no biodegradation observed , Other

Method: OECD Test Guideline 301C

GLP: Yes No ?

Test substance: Tripropylene glycol

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. ECOTOXICOLOGICAL DATA**4.1 ACUTE/PROLONGED TOXICITY TO FISH**

Type of test: static ; semi-static ; flow-through ; other
 open-system ; closed-system

Species: *Oryzias latipes*

Exposure period: 96 hr

Results: LC₅₀ (24h) > 1,000 mg/l
 LC₅₀ (48h) > 1,000 mg/l
 LC₅₀ (72h) > 1,000 mg/l
 LC₅₀ (96h) > 1,000 mg/l
 NOEC =
 LOEC =

Analytical monitoring: Yes No ?

Method: OECD Test Guideline 203 (1981)

GLP: Yes No ?

Test substance: Tripropylene glycol, purity = 97%

Remarks: A group of 10 *Oryzias latipes* were exposed to 5 nominal concentrations (95-1000 mg/l) and laboratory water control.

Reference: EA, Japan (1992)

4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES**A. Daphnia**

Type of test: static ; semi-static ; flow-through ; other
 open-system ; closed-system

Species: *Daphnia magna*

Exposure period: 24 hr

Results: EC₅₀ (24h) = > 1,000 mg/l
 EC₅₀ (48h) =
 NOEC =
 LOEC =

Analytical monitoring: Yes No ?

Method: OECD Test Guideline 202 (1984)

GLP: Yes No ?

Test substance: Tripropylene glycol, purity = 97%

Remarks: 20 daphnids (4 replicates; 5 organisms per replicate) were exposed to 5 nominal concentrations (10-1000 mg/l), control of DMSO:HCO-40= 9:1 (320 mg/l) and laboratory water control.

Reference: EA, Japan (1992)

B. Other aquatic organisms

No studies located

4.3 TOXICITY TO AQUATIC PLANTS e.g. Algae

Species: *Selenastrum capricornutum* ATCC 22662

End-point: Biomass ; Growth rate ; Other

Exposure period: 72 hr
 Results: Biomass: EC₅₀ (24h) =
 EC₅₀ (72h) > 1,000 mg/l
 NOEC = > 1000 mg/l (p < 0.05)
 LOEC =
 Analytical monitoring: Yes No ?
 Method: OECD Test Guideline 201 (1984)
 open-system ; closed-system
 GLP: Yes No ?
 Test substance: Tripropylene glycol, purity = 97%
 Remarks: The EC₃₀ values were calculated based on 5 nominal
 Concentrations (95-1000 mg/l) and laboratory water control.
 Reference: EA, Japan (1992)

4.4 TOXICITY TO BACTERIA

No studies located

4.5 CHRONIC TOXICITY TO AQUATIC ORGANISMS

4.5.1. CHRONIC TOXICITY TO FISH

No studies located

4.5.2. CHRONIC TOXICITY TO AQUATIC INVERTEBRATES

Type of test: static ; semi-static ; flow-through ; other ;
 open-system ; closed-system
 Species: *Daphnia magna*
 End-point: Mortality ; Reproduction rate ; Other
 Exposure period: 21 day
 Results: Mortality: LC₅₀ (24 h) > 1,000 mg/l
 LC₅₀ (48h)
 LC₅₀ (96 h) = > 1,000 mg/l
 LC₅₀ (7 d) > 1,000 mg/l
 LC₅₀ (14 d) > 1,000 mg/l
 LC₅₀ (21 d) > 1,000 mg/l
 NOEC =
 LOEC =
 Reproduction: EC₅₀ (14 d) > 1,000 mg/l
 EC₅₀ (21 d) > 1,000 mg/l
 NOEC = > 1,000 mg/l
 LOEC = > 1,000 mg/l
 Analytical monitoring: Yes No ?
 Method: OECD Test Guideline 202 (1984)
 GLP: Yes No ?
 Test substance: Tripropylene glycol, purity = 97%
 Remarks: 40 daphnids (4 replicates; 10 organisms per replicate) were exposed
 to 5 nominal concentrations (10-1000 mg/l), control of DMSO:
 HCO-40= 9:1 (320 mg/l) and laboratory water control.
 Reference: EA, Japan (1992)

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. TOXICITY**5.1 ACUTE TOXICITY****5.1.1 ACUTE ORAL TOXICITY**

(a)

Type : LD₀ []; LD₁₀₀ []; LD₅₀ [X]; LD_{L0} []; Other []
 Species/strain: Rat
 Value : = 3,000 (mg/kg)
 Method: Unknown
 GLP: Yes [] No [] ? [X]
 Test substance: Tripropylene glycol
 Remarks:
 Reference: Unpublished company data

(b)

Type : LD₀ []; LD₁₀₀ []; LD₅₀ [X]; LD_{L0} []; Other []
 Species/strain: Rat (Crj:CD(SD))
 Value : > 2,000 mg/kg
 Method: Unknown
 GLP: Yes [X] No [] ? []
 Test substance: Tripropylene glycol, Purity > 98 %
 Remarks:
 Reference: MHW, Japan (1993a)

5.1.2 ACUTE INHALATION TOXICITY

No studies located

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**

No studies located

5.2.2 EYE IRRITATION/CORROSION

No studies located

5.3 SKIN SENSITISATION

No studies located

5.4 REPEATED DOSE TOXICITY

Species/strain: Rat (Crj:CD(SD))
 Sex: Female ; Male ; Male/Female ; No data
 Route of Administration: Oral (gavage)
 Exposure period: Males: 49 days including 14 days before mating
 Females: from 14 days before mating to day 3 of lactation
 Frequency of treatment: 7 days/week
 Post exposure observation period:
 Dose: 0, 8, 40, 200 or 1,000 mg/kg (12 animals/group)
 Control group: Yes ; No ; No data ;
 Concurrent no treatment ; Concurrent vehicle ; Historical
 NOEL: 200 mg/kg/day
 LOEL: 1,000 mg/kg/day
 Results: In the clinical observation, salivation was observed in the 1,000 mg/kg male group. There were no differences in body weight gain, food consumption, clinical chemistry, or hematological parameters between the treated and control animals of both sexes. Increased absolute and relative liver weights, and increased relative kidney weight occurred in 1,000 mg/kg/day males group. Also, increased relative liver weight was observed in 1,000 mg/kg/day female group. In histopathological examinations, any changes which may have been caused by the test substance were not observed in the heart, kidneys, liver, thymus, testes, ovaries, epididymides, adrenal, brain or spleen in both sexes.
 Method: OECD Combined Repeat dose and Reproductive/Developmental Toxicity Test (1992)
 GLP: Yes No ?
 Test substance: Purity: > 98 %
 Reference: MHW, Japan (1993b)

5.5 GENETIC TOXICITY IN VITRO**A. BACTERIAL TEST**

(a)
 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, 312.5, 625, 1250, 2500 or 5000 µg/plate
 Metabolic activation: With ; Without ; With and Without ; No data
 Results:
 Cytotoxicity conc: With metabolic activation: 5000 µg/plate
 Without metabolic activation: 5000 µg/plate
 Precipitation conc:
 Genotoxic effects: + ? -
 With metabolic activation:
 Without metabolic activation:
 Method: Japanese Guideline for Screening Mutagenicity testing of chemicals
 GLP: Yes No ?
 Test substance: Commercial, purity: > 98 %
 Remarks: Procedure: Plate method
 Plates/test: 3

NOEL Parental :	1,000 mg/kg/day
NOEL F1 Offspring:	1,000 mg/kg/day
NOEL F2 Offspring:	N/A
Results:	There were no effects on mating, fertility, and oestrus cycle or on dams during the pregnancy and lactation period. External examination of pups revealed no increase in appearance of abnormal pups. Body weight gain of pups was normal. Pups killed at postnatal day 4 showed no abnormal gross findings. General parental toxicity: see section 5.4.
Method:	Combined Repeated Dose and Reproductive/Developmental Toxicity Test
GLP:	Yes [X] No [] ? []
Test substance:	Commercial, purity > 98 %
Remarks:	None
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

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