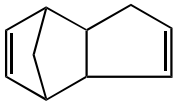


[FOREWORD](#)

[INTRODUCTION](#)

***DICYCLOPENTADIENE***  
***CAS N°: 77-73-6***

**SIDS INITIAL ASSESSMENT PROFILE**

<b>CAS No.</b>	77-73-6
<b>Chemical Name</b>	Dicyclopentadiene
<b>Structural formula</b>	

**CONCLUSIONS AND RECOMMENDATIONS**Environment

The chemical is moderately toxic to aquatic organisms and is considered not readily biodegradable. The predicted environmental concentration is lower than the predicted no effect concentration. It is currently considered of low potential risk and low priority for further work.

Health

The chemical is moderately toxic in repeated doses toxicity study (i.e. liver, kidney, adrenal) and an irritant to the skin and eyes. Within the Sponsor country exposure is well controlled based on the only known use as an intermediate in a closed system for the manufacture of resins. Consumer exposure and estimated daily intake through in-direct exposure are also considered to be low. As margin of safety is very large, 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**

Dicyclopentadiene is stable solid with a production volume of ca. 33,000 tonnes in 1993 in Japan. The chemical is used as an intermediate for production of resins in closed systems. This chemical is used as a consumer product at a concentration of 0.2% in Germany.

Dicyclopentadiene is considered not readily biodegradable. Direct photodegradation is expected and dicyclopentadiene has a high potential bioaccumulation. Modelling of the potential environmental distribution of dicyclopentadiene (obtained from a generic fugacity model (Mackay level III)) indicates that the chemical will be distributed mainly to water. Using production data from Japan and Germany the predicted environmental concentrations (PEC<sub>local</sub>) of this chemical were estimated for the aquatic environment as  $8.3 \times 10^{-4}$  mg/l and  $2.6 \times 10^{-2}$  mg/l respectively.

The lowest acute toxicity data to algae, zooplankton and fish were: 27mg/l (72 h-EC<sub>50</sub> of *Selenastrum*), 8mg/l (48 h EC<sub>50</sub> *Daphnia magna*) and 4.3 mg/l (96 h LC<sub>50</sub> of *Oryzias latipes*), respectively. The lowest chronic toxicity data to algae and zooplankton were; 18 mg/l (72 h-NOEC (growth) of *S. capricornutum*) and 3.2 mg/l (21d-NOEC (reproduction) *Daphnia magna*). The lowest acute and chronic toxicity data for each trophic level were considered in calculating the predicted no effect concentration (PNEC). An assessment factor of 100 was applied to both

acute and chronic toxicity data to determine the PNEC, because chronic toxicity data for fish was absent. The PNEC was calculated as 0.032 mg/l. The chemical is moderately toxic to fish, daphnids and algae however the predicted environmental concentration is lower than the predicted no effect concentration and therefore, the environmental risk is considered to be low.

The main route of human exposure is inhalation with a limited numbers of workers potentially exposed during tank filling, sampling and analytical work. The concentration in the atmosphere was measured at two production sites as 12.9 mg/m<sup>3</sup> (range 2.7 - 90 mg/m<sup>3</sup>) during sampling operations. Therefore, the worst case occupational Estimated Human Exposure (EHE<sub>inhal</sub>) may be estimated as 0.94 mg/kg/day. Indirect exposure via the environment, the daily intakes through drinking water and fish are estimated as 8.7 x 10<sup>-4</sup> mg/day and 1.5 x 10<sup>-2</sup> mg/kg/day, respectively, based on PEC<sub>local</sub> of 2.6 x 10<sup>-2</sup> mg/l.

Dicyclopentadiene is considered as an irritant to skin and eyes. This chemical showed no genotoxic effects in bacteria and chromosomal aberration tests *in-vitro*. In a combined repeat dose and reproductive/developmental toxicity screening test, both male and female rats showed slight suppression of body weight, and two female rats died before the pregnancy. Histopathological examination showed single cell necrosis in the liver, and hyaline droplets and basophilic change in the tubular epithelium of the kidneys in male rats. This compound had no effects on reproductive parameters. The no-observable effect level (NOEL) was identified as 4 mg/kg/day for repeated dose toxicity and 100 mg/kg/day for reproductive toxicity.

For human health, the risk for workers is expected to be low because the frequency of exposure is very limited and personal protective equipment is worn. The risks to the consumer and the general population through indirect exposure are also assumed to be low because a margin of safety through drinking water or fish is calculated to be 5600 or 267. Therefore, it is currently considered of low potential risk and low priority for further work.

**IF FURTHER WORK IS RECOMMENDED, SUMMARISE ITS NATURE**

## FULL SIDS SUMMARY

CAS NO: 77-73-6		SPECIES	PROTOCOL	RESULTS
<b>PHYSICAL-CHEMICAL</b>				
2.1	Melting Point			33.6 °C
2.2	Boiling Point			170.7 °C (at 1,013 hPa)
2.3	Density			0.977 g/m <sup>3</sup> at 35 °C
2.4	Vapour Pressure			1.3 x 10 <sup>3</sup> Pa at 37.7 °C
2.5	Partition Coefficient (Log Pow)		OECD TG 107	2.78
2.6 A.	Water Solubility		OECD TG 105	20 mg/l at 25 °C
B.	pH			not applicable
	pKa			not applicable
2.12	Oxidation: Reduction Potential			not applicable
<b>ENVIRONMENTAL FATE AND PATHWAY</b>				
3.1.1	Photodegradation			No data
3.1.2	Stability in Water		OECD TG 111	Stable at 25 °C for 5 days
3.2	Monitoring Data			Release: 100% to water In air = In surface water = not detected In soil = In sediment = not detected
3.3	Transport and Distribution		Calculated (Fugacity, Mackey level III type)  (local exposure)	Release: 100% to water In Air 28.2 % In Water 71.0 % In Sediment 0.8 % In Soil 0.0 %  8.3 x 10 <sup>-4</sup> mg/l (Japan) 2.6 x 10 <sup>-2</sup> mg/l (Germany)
3.5	Biodegradation		OECD TG 301C	not readily biodegradable
3.7	Bioaccumulation		OECD TG 305C	BCF: 58.9 - 384
<b>ECOTOXICOLOGY</b>				
4.1	Acute/Prolonged Toxicity to Fish	<i>Orizias latipes</i>	OECD TG 203	LC <sub>50</sub> (24 hr) = 11 mg/l, LC <sub>50</sub> (48 hr) = 6.7 mg/l, LC <sub>50</sub> (72 hr) = 6.7 mg/l, LC <sub>50</sub> (96 hr) = 4.3 mg/l
4.2	Acute Toxicity to Aquatic Invertebrates <i>Daphnia</i>	<i>Daphnia magna</i>	OECD TG 202	EC <sub>50</sub> (24 hr) = 8.6 mg/l, EC <sub>50</sub> (48 hr) = 8.0 mg/l,
4.3	Toxicity to Aquatic Plants e.g. Algae	<i>Selenastrum capricornutum</i>	OECD TG 201	EC <sub>50</sub> (72 hr) = 27.0 mg/l NOEC = 18 mg/l
4.5.2	Chronic Toxicity to Aquatic Invertebrates ( <i>Daphnia</i> )	<i>Daphnia magna</i>	OECD TG 202	EC <sub>50S</sub> (21d) = 4.0 mg/l (Reproduction) NOEC(21d) = 3.2mg/l (Reproduction)
4.6.1	Toxicity to Soil Dwelling Organisms			No data

4.6.2	Toxicity to Terrestrial Plants			No data
4.6.3	Toxicity to Other Non-Mammalian Terrestrial Species (Including Birds)			No data
<b>TOXICOLOGY</b>				
5.1.1	Acute Oral Toxicity		Other (unknown)	LD <sub>50</sub> = 353 mg/Kg
5.1.2	Acute Inhalation Toxicity		Other (unknown)	LC <sub>50</sub> = 1,000 ppm/4 hr
5.1.3	Acute Dermal Toxicity		Other (unknown)	LD <sub>50</sub> = 5,080 mg/Kg
5.4	Repeated Dose Toxicity	Rat	OECD Combined	NOEL = 4 mg/Kg
5.5	Genetic Toxicity In Vitro			
A.	Bacterial Test (Gene mutation)	S. typhimurium E. coli WP2	Japanese TG	- (With metabolic activation) - (Without metabolic activation)
B.	Non-Bacterial In Vitro Test (Chromosomal aberrations)	Chinese hamster CHL cells	Japanese TG	- (With metabolic activation) - (Without metabolic activation)
5.6	Genetic Toxicity In Vivo			No data
5.8	Toxicity to Reproduction	Rat	OECD combined	NOEL = 100 mg/Kg
5.9	Developmental Toxicity/ Teratogenicity			No data
5.11	Experience with Human Exposure			No data

[Note] Data beyond SIDS requirements can be added if the items are relevant to the assessment of the chemical, e.g. corrosiveness/irritation, carcinogenicity.

# SIDS Initial Assessment Report for 7th SIAM

(Australia, March 25-27, 1998)

Chemical Name: Dicyclopentadiene  
CAS No: 77-73-6  
Sponsor Country: Japan

National SIDS Contact Point in Sponsor Country: Mr. Kenichi Suganuma  
Ministry of Foreign Affairs, Japan

## HISTORY:

SIDS Testing Plan were reviewed in SIDS Review Process, where the following SIDS Testing Plan was agreed:

no testing ( )  
testing ( X ) Octanol/water partition coefficient, Water solubility  
Stability in water, Monitoring data  
Transport and Distribution, Biodegradation  
Acute toxicity to fish, daphnia and to algae  
Chronic toxicity to daphnia  
Combined repeat dose and reproductive toxicity test  
Gene mutation  
Chromosomal aberration test in vitro

In March, 1998, we received comments for draft SIAR from some member countries. Therefore, SIAR was revised before SIAM-7. Main revision was done in Section of human health and summary.

Deadline for circulation: December 31, 1997

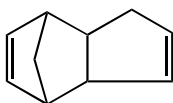
Date of Circulation: January 29, 1998

Date of Recirculation: March 16, 1998

(To all National SIDS Contact Points and the OECD Secretariat)

**SIDS INITIAL ASSESSMENT REPORT****Dicyclopentadiene**  
(CAS No. 77 - 73 - 6)**1. IDENTITY**

- OECD Name: Dicyclopentadiene
- Synonym:
- CAS Number: 77 - 73 - 6
- Empirical Formula:
- Structural Formula:



- Degree of Purity:
- Major Impurity:
- Essential Additives:
- Physical-chemical properties
  - Melting Point: 33.6 °C
  - Vapour pressure:  $1.3 \times 10^3$  Pa at 37.7 °C
  - Water solubility: 20 mg/l at 25 °C
  - Log Pow: 2.78

**2. GENERAL INFORMATION ON EXPOSURE****2.1 Production and import**

The production volume of dicyclopentadiene in Japan is 33,772 tonnes/year in 1993. According to ECDIN database, the production levels of this chemical in EEC and USA are 75,000 tonnes/year in 1980 and 122,000 tonnes/year in 1993, respectively. According to IUCLID, maximum production amount is 50,000 tonnes/year.

**2.2 Use pattern**

All of dicyclopentadiene produced in Japan is used as intermediate for resins, and no consumer use are reported.

**2.3 Other information**

None

**3. ENVIRONMENT****3.1 Environmental Exposure****3.1.1 General Discussion**

Dicyclopentadiene is stable abiotically (OECD 111) and biotically (OECD 301C: 0% after 14d) in water. Direct photodegradation is expected because dicyclopentadiene has strong absorption band at UV region.

Dicyclopentadiene has high bioaccumulation potential (BCF: 58.9 – 384 for Carp)

The potential environmental distribution of dicyclopentadiene obtained from a generic fugacity model (Mackay level III) is shown in Table 1. Parameters used for this model are shown in an Annex to this report. The results show that, if dicyclopentadiene is released into air, it is unlikely to be distributed into other compartment. If dicyclopentadiene is released into water or soil, it is likely to be transported to air.

Table 1 Environmental distribution of dicyclopentadiene  
Using a generic fugacity model (Mackey level III).

Compartment	Release 100% to air	Release 100% to water	Release 100% to soil
Air	99.9 %	28.2 %	68.1 %
Water	0.0 %	71.0 %	0.1 %
Soil	0.1 %	0.0 %	31.8 %
Sediment	0.0 %	0.8 %	0.0 %

As this chemical is used in a closed system and is not used for consumer products, its release to environments may occur only from the production site.

In Japanese environmental survey, dicyclopentadiene was not detected from surface water and bottom sediments in 1978 and 1089. Detection limits in this survey was 0.0001 mg/l and 0.005 mg/kg.

### 3.1.2 Predicted Environmental Concentration

As dicyclopentadiene is produced under the well controlled closed system, amount of release to air phase is negligibly small. The waste of dicyclopentadine from the production system is released to water phase after treated at its own wastewater treatment plant. Therefore, Predicted Environmental Concentration (PEC) will be calculated only for the water environment.

#### a. Local exposure

According to a Japanese manufacturer (A), 8,000 kg/y (estimated) of dicyclopentadiene is treated by their waste water treatment plant of the manufactory. Although dicyclopentadine is not readily biodegradable, 98% of it is removed by adsorption to sludge or voratization. The treatment plant releases  $2.5 \times 10^9$  l/year of effluent to the river which has annual mean flow rate of  $4.7 \times 10^{11}$  l/year. In this case, the dilution factor is 190. Local Predicted Environmental Concentration ( $PEC_{local}$ ) is calculated to be  $3.4 \times 10^{-4}$  mg/l employing the following formula.

$$\frac{\text{Amount of release (} 8.0 \times 10^9 \text{ mg/y) x (100 - Removal rate (98))}}{100 \times \text{Volume of effluent (} 2.5 \times 10^9 \text{ l/year) x Dilution Factor (190)}}$$



So that the flow rate of the river on dry season is estimated around 1/2.5 of annual mean flow rate in Japan, the dilution factor will be calculated 76 instead of 190 on dry season. In this case,  $PEC_{local}$  is calculated to be  $8.3 \times 10^{-4}$  mg/l, as the worst case.

According to a Japanese manufacturer (B), 5.6 kg/year (estimated) of dicyclopentadiene is released with  $2.4 \times 10^8$  l/year of effluent into a bay. Local Predicted Environmental Concentration ( $PEC_{local}$ ) is calculated to be  $2.3 \times 10^{-5}$  mg/l employing the following formula. In this case, we use 1000 as the dilution factor.

Amount of release ( $5.6 \times 10^6$  mg/y)  
 Volume of effluent ( $2.4 \times 10^8$  l/y) x Dilution factor (1000)

According to a German exposure information, German proposed to integrate a generic exposure scenario using the following parameters.

Production volume:	50,000 tonnes/year (maximum production volume given in IUCLID)
Emission factor:	1 % (production and processing at the same site)
number of production days:	300 days/year
Elimination in stp:	92 % (according to the Simpletreat)
Flow-rate of receiving river:	60 m <sup>3</sup> /s (according to the TGD)

With this data, a  $PEC_{local}$  of about  $2.6 \times 10^{-2}$  mg/l can be calculated.

b. Regional exposure

No data are available.

### 3.2 Effects on the Environments

#### 3.2.1 Effects on aquatic organisms

Acute and chronic toxicity data of dicyclopentadiene to aquatic organisms are summarized below (Table 1). Toxicity of this chemical to aquatic organisms is not so high, because the toxicity in all available data are higher than 1 mg/l and do not differ much among the species used for the tests.

Predicted No Effect Concentration (PNEC) of this chemical was determined mainly based on the toxicity data obtained by the Environmental Agency of Japan. Other data reported by different organizations, which were thought to be reliable, were also listed to evaluate effects of this chemical on aquatic environments (Table I).

As the lowest acute toxicity data to each of algae, zooplankton and fish, 72 h- $EC_{50}$  of *Selenastrum* (27 mg/l), 48 h  $EC_{50}$  of *Daphnia magna* (8 mg/l) and 96 h  $LC_{50}$  of *Oryzias latipes* (4.3 mg/l) from Table I were selected, respectively to determine PNEC.

As the lowest chronic toxicity data to algae and Zooplankton, 72 h-NOEC (growth) of *S. capricornutum* (18 mg/l) and 21d-NOEC (reproduction) of *Daphnia magna* (3.2 mg/l) were adopted. The assessment factors of 100 were applied to both acute and chronic

toxicity data to determine PNEC according to the OECD Provisional Guidance for Initial Assessment of Aquatic Effects (EXCH/MANUAL/96-4-5.DOC/May 1996), because chronic toxicity data for fish was absent.

From acute toxicity data (96h-LC<sub>50</sub> fish): PNEC = 4.3/ 100 = 0.043 mg/l

From chronic toxicity data (NOEC of 21d Daphnia): PNEC = 3.2/ 100 = 0.032 mg/l

Thus, PNEC of dicyclopentadiene is 0.032 mg/l in the present report.

The LC<sub>50</sub> values of *Oryzias latipes* and other several species of fish (Table 1) decreased significantly day by day during the 4-d acute toxicity tests, suggesting the necessity of chronic toxicity tests on fish and/or other aquatic organisms since LC<sub>50</sub> values of fish acute toxicity usually do not change so much in most chemicals.

**Table 1**

Acute and chronic toxicity data of dicyclopentadiene to aquatic organisms at different trophic levels. The data (ref. 1) by the Environmental Agency of Japan are from the tests conducted based on the OECD Test Guide Lines.

Species	Endpoint	Conc. (mg/l)	Notes
<i>Selenastrum capricornutum</i> (algae)	Gro 72 h EC <sub>50</sub>	27.0	1), A
	72 h NOEC	18.0	1), C
	Gro 6 h EC <sub>50</sub>	>100	2)
<i>Dugesia japonica</i> (Flatworm)	Mor 7 d LC <sub>50</sub>	50.1	3)
<i>Tetrahymena pyriformis</i> (Ciliata)	Gro 24 h EC <sub>50</sub>	5.3	4
<i>Asellus militaris</i> (Aquatic sowbug)	Mor 48 h LC <sub>50</sub>	15.0	5)
<i>Gammarus fasciatus</i> (Scud)	Mor 48 h LC <sub>50</sub>	21.2	5)
<i>Chironomus tentans</i> (Midge)	Mor 48 h LC <sub>50</sub>	120.0	5)
<i>Daphnia magna</i> (Water flea)	Imm 24 h EC <sub>50</sub>	8.6	1)
	48 h EC <sub>50</sub>	8.0	1), A
	Mor 48 LC <sub>50</sub>	10.5	5)
	Rep 21d NOEC	3.2	1), C
<i>Moina macrocopa</i> (Water flea)	Imm 48 h EC <sub>50</sub>	40.0	2)
<i>Moina macrocopa</i>	Mor 3 h LC <sub>50</sub>	39.8	3)
<i>Oryzias latipes</i> (fish, Medaka)	Mor 24 h LC <sub>50</sub>	11.0	1)
	48 h LC <sub>50</sub>	6.7	1)
	72 h LC <sub>50</sub>	6.7	1)
	96 h LC <sub>50</sub>	4.3	1), A
	Mor 48 h LC <sub>50</sub>	23.0	3)
	Mor 96 h LC <sub>50</sub>	25.0	2)
<i>Ictalurus punctatus</i> (Channel catfish)	Mor 24 h LC <sub>50</sub>	21.7	5)
	48 h LC <sub>50</sub>	20.0	5)
	96 h LC <sub>50</sub>	15.7	5)
	Mor 96 h LC <sub>50</sub>	16.0	2)
<i>Lepomis macrochirus</i> (Bluegill)	Mor 24 h LC <sub>50</sub>	41.0	5), x)
	48 h LC <sub>50</sub>	33.7	5), x)
	96 h LC <sub>50</sub>	30.5	5), x)

<i>Lepomis macrochius</i> (fish)	Mor 96 h LC <sub>50</sub>	23.0	5)
<i>Pimephales promelas</i> (Fathead minnow)	Mor 96 h LC <sub>50</sub>	12.0	5)
<i>Ocorhynchus mykiss</i> (Rainbow trout)	Mor 24 h LC <sub>50</sub>	23.7	5)
	48 h LC <sub>50</sub>	15.9	5)
	96 h LC <sub>50</sub>	15.9	5)
<i>Salmo gairdneri</i> (fish)	Mor 96 h LC <sub>50</sub>	16.0	5)

Notes: Gro; growth, Mor; mortality, Imm; immobilization, Rep; reproduction, No. 1-5), reference number, A), C); selected as the lowest value respectively among the acute or chronic toxicity data of algae, cladoceran (water flea) and fishes to determine PNEC of dicyclopentadiene; x) mean value of 15 replicate data in AQUIRE.

### References

- 1) Toxicity data by the Environmental Agency of Japan, the tests were conducted based on OECD Test Guide Lines.
- 2) ECETOX Bericht No. 19, Dicyclopentadiene. from IUCRID, (Feb., 1996), Dow Benelux N.V. Terneuzen.
- 3) Yoshioka, Y., Ose, Y. and Sato, T. (1986) Correlation of the five test methods to assess chemical toxicity and relation to physical properties. *Ecotoxicol. Environ. Saf.* 70-80.
- 4) Yoshioka, Y. (1985) Testing for the toxicity of chemicals with *Tetrahymena pyriformis*. *Sci. Total Environ.*, 43, 149-157.
- 5) Bentley, R.E., LeBlanc, G.A., Hollister, T.A., and Sleight, B.H. (1976) Acute toxicity of diisopropylmethyl phosphonate and dicyclopentadiene to aquatic organisms. Contact No. DAMD-17-75-C-5073 Final Report, U.S. Army Medical Res. Develop. Command, Washington, D.C.: 98 p. (5965)

### 3.2.2 Terrestrial effects

No data available.

### 3.2.3 Other effects

No data are available.

## 3.3 Initial Assessment for the Environment

Predicted no effect concentration (PNEC)

Predicted no effect concentration (PNEC) of dicyclopentadiene for aquatic organisms has been calculated as 0.032 mg/l (21-d NOEC, reproduction of *Daphnia magna*) based on the lowest acute and/or chronic toxicity data among algae, cladoceran (water flea) and fishes.

PNEC is calculated using NOEC (3.2 mg/l) and assessment factor of 100.

$$\text{PNEC} = 3.2/100 = 0.032 \text{ mg/l}$$

PEC from Japanese local exposure scenario is  $8.3 \times 10^{-4}$  mg/l.

$$\text{PEC}_{\text{local}}/\text{PNEC} = 8.3 \times 10^{-4}/0.032 = 2.6 \times 10^{-2} < 1$$

PEC from German local exposure scenario is  $2.6 \times 10^{-2}$  mg/l.

$$\text{PEC}_{\text{local}}/\text{PNEC} = 2.6 \times 10^{-2}/0.032 = 0.81 < 1$$

Effects of this chemical on aquatic ecosystems is at low concern at present, because PEC/PNEC of this chemical is lower than 1.

## 4. HUMAN HEALTH

### 4.1 Human Exposure

#### 4.1.1 Occupational exposure

Dicyclopentadiene is produced for an intermediate for resins, synthetic rubbers and other chemicals, in closed systems. Occupational exposures in production sites were expected in quality control sampling and subsequent analysis, and tank truck loading operations. The main route of exposure is inhalation and dermal exposure may be possible during sampling operation.

The exposure levels were measured at two production facilities. Air samples were taken at 20 to 40 cm away from the worker's face, using charcoal tube and analysed by GC with FID.

Workers wear protective gloves and respiratory protective equipment during sampling operation and coupling and decoupling operation for tank filling. Entire facility is located in an open space, and all these operations were done in the open space. Durations and frequencies of sampling, analysis of the sample and tank loading were 1 minute, 3 times/day, 10 minutes, 3 times/day, and 20 minutes, 3 times/day.

The exposure levels are:

Inhalation exposure

Sampling 12.9 mg/m<sup>3</sup> (max 90.0, min 2.7; 11 samples)

Analysis of the sample < 2.7 mg/m<sup>3</sup> (less than detection limit; 2 samples)

Tank filling 9.2 mg/m<sup>3</sup> (max 32.9, min 2.7; 15 samples)

If a single worker is assigned to implement all above daily operation without protective equipment, the daily intake is calculated as 0.94 mg/kg/day, based on the average atmosphere concentration.

Dermal exposure

0.1 - 1 mg/cm<sup>2</sup>/day estimated by EU Exposure Model

Since the workers use protective equipment, the exposure to skin is expected to be much lower than the above.

#### 4.1.2 Consumer exposure

No data on consumer exposure are available in Japan. In Germany, this chemical is used as the consumer product named ArcotalS at a concentration of 0.2%. ArcotalS protects against damages done by bites of game.

#### 4.1.3 Indirect exposure via the environment

As dicyclopentadiene is not biodegradable, and high bioaccumulative, the exposure to the general population via the environment would be possible through drinking water processed from surface water and through fish which may accumulate this chemical.

Based on the physical chemical properties of this chemical (e.g. relatively high water solubility to the PEC calculated in Section 3.1.2), a significant removal during the processing is not expected. Therefore, the concentration in drinking water should be estimated to be equal to PEC calculated in Section 3.1, i.e.  $2.6 \times 10^{-2}$  mg/l, as the worst case. The daily intake through drinking water is calculated as  $8.7 \times 10^{-4}$  mg/kg/day (2 l/day, 60 kg b.w.).

Using the maximum bioconcentration factor of 384 obtained by tests, the concentration of this chemical in fish can be calculated as follows:

$$PEC_{\text{fish}} = (2.6 \times 10^{-2} \text{ mg/l}) \times 384 = 9.98 \times 10^{-3} \text{ mg/g-wet}$$

As a daily intake of fish in Japan is estimated to be 90 g for 60 kg body weight person, a daily intake of this chemical will be  $1.5 \times 10^{-2}$  mg/kg/day.

## 4.2 Effects on Human Health

### a) Acute toxicity

SIDS data: Oral/Rat: LD<sub>50</sub>: 590 mg/kg  
Inhalation/Rat: LC<sub>50</sub>: 1,000 ppm/4 hr  
Dermal/Rabbit: LD<sub>50</sub>: 5,080 mg/kg

### b) Irritation

Most of reported data on skin irritation effects of dicyclopentadiene are shown moderate to highly irritant to skin. However, dose levels are not known except one report (20 mg/24 hrs).

Eye irritation was investigated in three studies. These reports resulted in slight to moderate irritation. Dose levels of two reports was 500 mg/24 hrs.

The chemical is classified and labelled in the EU Directive 67/548/EEC with R-phrases 36/37/38 which means irritating to eyes, respiratory system and skin, supported by animal and human experiments.

### c) Sensitisation

Draize test using guinea pig was reported, but result was negative.

### d) Repeated toxicity

SIDS data: Dicyclopentadiene was performed for oral toxicity in SD(Crj:CD) rats in an OECD combined repeat dose and reproductive/developmental toxicity screening test at doses of 0 (vehicle: olive oil), 4, 20, 100 mg/kg/day.

In the 100 mg/kg group, both male and female rats showed slight suppression of body weight gain and decrease in food consumption, and two female rats died before their pregnancy. Histopathological examination showed single cell necrosis in the liver, and hyaline droplets and basophilic change in the tubular epithelium of the kidneys in male rats. The weights of these organs were also increased. An increase of fatty droplets in the fascicular zone of the adrenals was observed in both male and female rats. Blood chemistry examination in male rats showed increases in GOT and GPT. Similar histopathological changes were found in the

kidney of the 20 mg/kg male rats and in the adrenals of the 20 mg/kg male rats. There were no hematological changes ascribable to the compound in any group.

NOEL: 4 mg/kg/day for males and 20 mg/kg/day for females

LOEL: 20 mg/kg/day for males and 100 mg/kg/day for females

In an inhalation study of dicyclopentadiene using F-344 rats for 13 weeks at doses of 0, 5.4, 27.5 and 275 mg/m<sup>3</sup> (6 hr/day), no signs of toxicity were seen in the females. Histopathological examination of kidneys in males revealed dose-dependent tubular hyperplasia, interstitial nephritis and glomerular basement membrane thickening. These kidney toxicities are male rat specific. NOAEL was reported as 275 mg/m<sup>3</sup> (highest dose).

It is considered that the above renal toxicity observed in male rats was caused by accumulation of alpha-2-microglobulin, a male rat specific protein, but no direct evidence such as immunostaining was conducted in any toxicity studies.

Another investigation for inhalation toxicity using male beagle dog for 89 days at doses 0, 48.0, 126.7 and 174.6 mg/m<sup>3</sup> (6 hrs/day) was reported. Toxicity was not seen during the exposure period.

e) Reproductive/developmental toxicity

SIDS data: Dicyclopentadiene was performed for oral toxicity in SD (Crj:CD) rats in an OECD combined repeat dose and reproductive/developmental toxicity screening test at doses of 0 (vehicle: olive oil), 4, 20, 100 mg/kg/day.

The compound had no effects on reproductive parameters such as the mating index, the fertility index, gestation length, number of corpora lutea or implantations, the implantation index, the gestation index, the delivery index or parturition. Two dams of the 100 mg/kg group, however, did not nurse their litters and lost all of them within 2 days. There were no significant differences in number of offspring or live offspring at birth, sex ratio or the live birth index. No abnormal findings ascribable to the compound were found for external features, clinical signs, or on necropsy of the offspring.

NOEL for P generation: 100 mg/kg/day for males; 20 mg/kg/day for females

NOEL for F1 generation: 100 mg/kg/day

f) Genetic toxicity

Bacterial test:

Negative results in *S. Typhimurium* TA100, TA98, TA1535, TA1537, TA1538 with and without metabolic activation.

Chromosomal aberration test in vitro:

Dicyclopentadiene did not induce structural chromosomal aberration or polyploidy in CHL/IU cells up to a concentration more than that causing 50% cell growth inhibition, in the absence or presence of an exogenous metabolic activation system. Structural chromosomal aberrations were marginally induced by a high concentration (0.057 mg/ml) after 24-h continuous treatment. However, negative findings were confirmed in the in vitro micronucleus test.

#### 4.3 Initial Assessment for Human Health

Dicyclopentadiene was not mutagenic in bacterial test and chromosomal aberration test in vitro. NOEL was 4 mg/kg/day for repeat dose toxicity and 100 mg/kg/day reproductive toxicity. Dicyclopentadiene is considered as an irritant to skin and eyes, but not sensitizer.

Dicyclopentadiene is used as an intermediate in a closed system at industries, and workers wear protective gloves and respiratory protective equipments during operation. Therefore, the exposure route for human is an inhalation in limited workers. If a single worker is assigned to implement all daily operation without protective equipment, the daily intake through inhalation is calculated as 0.94 mg/kg/day, based on the average atmosphere concentration. Average concentration in atmosphere is 12.9 mg/m<sup>3</sup> and operation frequency is 3 times in a day but the operation time is only 1 minute. In inhalation animal studies, NOAELs are 275 mg/m<sup>3</sup> (6h/d, 5d/w, 13w) for rats and 174.6 mg/m<sup>3</sup> (7h/d, 5d/w, 89d) for dogs except kidney toxicity in male rats. In repeated gavage study, kidney toxicity is also observed in male rats. It is suggested that this toxicity is induced by alpha-2-microglobulin, a male rat specific protein. Furthermore, the odor threshold is 0.016-0.031 mg/m<sup>3</sup> and limit value of ACGIH TLV-TWA is 5 ppm (27.0 mg/m<sup>3</sup>).

As for indirect exposure via environment, PEC<sub>local</sub> of 2.6 x 10<sup>-2</sup> mg/l from local exposure scenario was used for the estimation. The daily intakes through drinking water and fish are calculated as 8.7 x 10<sup>-4</sup> mg/kg/day and 1.5 x 10<sup>-2</sup> mg/kg/day, respectively. Since margin of safety is very large, such as 5600 from drinking water and 267 from fish, health risk is presumably low.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

Dicyclopentadiene is moderately toxic to aquatic organisms and is considered as not readily biodegradable. PEC/PNEC ratios are less than 1 based on one default scenario. For environment, it is currently considered of low potential risk and low priority for further work.

The chemical is moderately toxic in a repeated dose study (i.e. liver, kidney, adrenal). This chemical is considered as an irritant to skin and eyes. However, exposure at production site is well controlled because this chemical is used as an intermediate in a closed system in the Sponsor country. Estimated daily intake through in-direct exposure is also considered to be low. As margin of safety is very large, it is currently considered of low potential human risk and low priority for further work.

### 5.2 Recommendations

No recommendation

## 6. REFERENCES

**ANNEX:** Calculation data in generic fugacity model (Mackey level III)  
Full SIDS Dossier

**REVISED OECD HPV FORM 1**

**SIDS DOSSIER**  
**ON THE HPV PHASE-4 CHEMICAL**

**Dicyclopentadiene**

**CAS No. 77 - 73 - 6**

Sponsor Country: Japan

DATE: January 29, 1998



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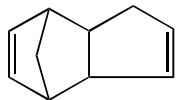
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## 6. REFERENCES

Note: \*;Data elements in the SIDS  
†;Data elements specially required for inorganic chemicals

**SIDS PROFILE**

DATE: January 29, 1998

1.01 A.	<b>CAS No.</b>	77-73-6
1.01 C.	<b>CHEMICAL NAME (OECD Name)</b>	Dicyclopentadiene
1.01 D.	<b>CAS DESCRIPTOR</b>	not applicable
1.01 G.	<b>STRUCTURAL FORMULA</b>	
	<b>OTHER CHEMICAL IDENTITY INFORMATION</b>	
1.5	<b>QUANTITY</b>	33,772 tonnes/year in 1993 (Japan)
1.7	<b>USE PATTERN</b>	Industrial use; Intermediates for resins No consumer use
1.9	<b>SOURCES AND LEVELS OF EXPOSURE</b>	In Japan, amount released from production site to water is 8,000 kg or 5.6 kg/year in 1997.  Occupational exposure is low.
<b>ISSUES FOR DISCUSSION (IDENTIFY, IF ANY)</b>	SIDS testing required: Octanol/water partition coefficient, Water solubility Stability in water, Monitoring data Transport and distribution, Biodegradation Acute toxicity to fish, daphnia and to algae Chronic toxicity to daphnia Combined repeat dose and reproductive toxicity Gene mutation Chromosomal aberration test in vitro	

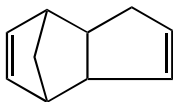
**SIDS SUMMARY**

DATE: January 29, 1998

CAS NO: 77-73-6		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
<b>PHYSICAL-CHEMICAL DATA</b>								
2.1	Melting Point	Y	N	N			Y	N
2.2	Boiling Point	Y	N	N			Y	N
2.3	Density	Y	N	N			Y	N
2.4	Vapour Pressure	Y	N	N			Y	N
2.5	Partition Coefficient	N						Y
2.6	Water Solubility	N						Y
	pH and pKa values	N						N
2.12	Oxidation: Reduction potential	N						N
OTHER P/C STUDIES RECEIVED								
<b>ENVIRONMENTAL FATE and PATHWAY</b>								
3.1.1	Photodegradation	N						N
3.1.2	Stability in water	N						Y
3.2	Monitoring data	N						Y
3.3	Transport and Distribution	N						Y
3.5	Biodegradation	N						Y
OTHER ENV FATE STUDIES RECEIVED								
<b>ECOTOXICITY</b>								
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								
<b>TOXICITY</b>								
5.1.1	Acute Oral	Y	N	N	Y	N	N	Y
5.1.2	Acute Inhalation	Y	N	N	Y	N	N	Y
5.1.3	Acute Dermal	Y	N	N	Y	N	N	Y
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	Y	N	N	Y	N	Y	N
5.11	Human experience	N						N
OTHER TOXICITY STUDIES RECEIVED								

**1. GENERAL INFORMATION****1.01 SUBSTANCE INFORMATION**

- \*A. Cast number** 77-73-6
- B. Name (IUPAC name)** 3a,4,7,7a-Tetrahydro-4,7-methanoindene
- \*C. Name (OECD name)** Dicyclopentadiene
- †D. CAS Descriptor**
- E. EINECS-Number** 201-052-9
- F. Molecular Formula** C<sub>10</sub>H<sub>12</sub>
- \*G. Structural Formula**



- H. Substance Group**
- I. Substance Remark**
- J. Molecular Weight** 132.21

**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)  
Ministry of Labour (MOL)

Contact person: Mr. Kenichi Suganuma  
Director, Second International Organization Bureau  
Ministry of Foreign Affairs

Address:

Street: 2-2-1 Kasumigaseki, Chiyoda-ku, Tokyo 100, Japan

Tel: 81-3-3581-0018

Fax: 81-3-3503-3136

**C. Name of responder**

Name: 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 (at 20°C and 1.013 hPa)**

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

**C. Purity**

95 %

**1.2 SYNONYMS**

4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
Bicyclopentadiene  
Cyclopentadiene dimer  
Tricyclo[5.2.1.02,6]deca-3,8-diene  
Tricyclo-(5,2,1,0)-3,8-decadiene  
DCPD

**1.3 IMPURITIES**

Unknown

**1.4 ADDITIVES**

None

**\*1.5 QUANTITY**

- (1) 33,772tonnes/year in 1993 (Japan)
- (2) 75,000tonnes/year in 1980 (EEC)
- (3) 122,000 tonnes/year in 1993 (USA)

Remarks: (2,3) not validated

Reference: (1) MITI, Japan (1997)  
(2,3) ECDIN Database

**1.6 LABELLING AND CLASSIFICATION****1.6.1 Labelling**

Labelling: as in Directive 67/548/EEC  
Symbols: F  
Xn  
Specific limits: no

R-Phrases: (11) Highly Flammable  
(20/22) Harmful by inhalation and if swallowed.  
(36/37/38) Irritating to eyes, respiratory system and skin  
S-Phrases: (2) Keep out of reach of children  
(36/37) Wear suitable protective clothing and gloves  
Marking: non confidential

### 1.6.2 Classification

Classification: as in Directive 67/548/EEC  
Class of danger: harmful  
R-Phrases: (20/22) Harmful by inhalation and if swallowed  
Marking: non confidential  
Reference: IUCLID Database

Classification: as in Directive 67/548/EEC  
Class of danger: highly flammable  
R-Phrases: (11) highly flammable  
Marking: non confidential  
Reference: IUCLID Database

Classification: as in Directive 67/548/EEC  
Class of danger: irritant  
R-Phrases: (36/37/38) Irritating to eyes, respiratory system and skin  
Marking: non confidential  
Reference: IUCLID Database

## \*1.7 USE PATTERN

### A. General

#### Type of Use:

- (a) main industrial use

#### Category:

Intermediate  
Intermediate in closed system  
Intermediate for ethylene-propylene elastomers for resins, Pesticides, flame retardants, adhesive, coatings

Reference: ECDIN Database

### B. Uses in Consumer Products

No consumer use are known.

Reference: MITI, Japan (1997)

## 1.8 OCCUPATIONAL EXPOSURE LIMIT

No occupational exposure limit value are available in Japan.



Type of limit:	ACGIH TLV-TWA
Limit value:	27 mg/m <sup>3</sup> (5 ppm)
Type of limit:	MAC (NL)
Limit value:	30 mg/m <sup>3</sup>
Country:	Netherland
Source:	Dow Benelux N. V. Terneuzen
Type of limit:	MAC (NL)
Limit value:	3 mg/m <sup>3</sup>
Country:	Netherlands
Source:	Shell Netherland Chemie B. V. Hoogvliet-Rotterdam
Type of limit:	MA k (DE)
Limit value:	3 mg/m <sup>3</sup>
Short term exposure	
Limit value:	6 mg/m <sup>3</sup>
Schedule:	5 minute
Frequency:	8 times
Country:	Germany
Source:	Dow Benelux N. V. Terneuzen
Type of limit:	OES (UK)
Limit value:	30 mg/m <sup>3</sup>
Country:	United Kingdom
Source:	Dow Benelux N. V. Terneuzen
Type of limit:	YLV (US)
Limit value:	27 mg/m <sup>3</sup>
Country:	USA
Source:	Dow Benelux N. V. Terneuzen Shell Netherland Chemie B. V. Hoogvliet-Rotterdam

### \* 1.9 SOURCES OF EXPOSURE

Two Japanese companies produced dicyclopentadiene.

(1) Source: Media of release: River  
Quantities per media: 8,000 kg/year

(2) Source: Media of release: Bay  
Quantities per media: 5.6 kg/year

Remarks:

Reference: MITI, Japan (1997)

### 1.10 ADDITIONAL REMARKS

#### A. Options for disposal

Remarks: Treatment in sewage plant, then release  $2,5 \times 10^9$  l/year of effluent to river with flow rate of  $4.7 \times 10^{11}$ .  
 Reference: Company data

## B. Other remarks

None

## 2. PHYSICAL-CHEMICAL DATA

### \*2.1 MELTING POINT

(a)

Value: 33.6 °C  
 Decomposition: Yes [ ] No [X] Ambiguous [ ]  
 Sublimation: Yes [ ] No [X] Ambiguous [ ]  
 Method: Unkown  
 GLP: Yes [ ] No [X] ? [ ]  
 Remarks:  
 Reference: Kagaku daijiten (Chemical dictionary)

(b)

Value: 32.5 °C  
 Decomposition: Yes [ ] No [X] Ambiguous [ ]  
 Sublimation: Yes [ ] No [X] Ambiguous [ ]  
 Method: Unkown  
 GLP: Yes [ ] No [ ] ? [X]  
 Remarks: Melting point is dependent on the purity of the product.  
 Reference: IUCLID Database

### \*2.2 BOILING POINT

(a)

Value: 170.7 °C  
 Pressure: at 1,013 hPa  
 Decomposition: Yes [ ] No [X] Ambiguous [ ]  
 Method: Unknown  
 GLP: Yes [ ] No [X] ? [ ]  
 Remarks:  
 Reference: Kagaku Daijiten (Chemical dictionary)

(b)

Value: 170 - 172.8 °C  
 Pressure: at 1,013 hPa  
 Decomposition: Yes [ ] No [X] Ambiguous [ ]  
 Method: Unknown  
 GLP: Yes [ ] No [ ] ? [X]  
 Remarks:  
 Reference: IUCLID Database

**\*2.3 DENSITY (relative density)**

Type: Bulk density [ ]; Density [X]; Relative Density [ ]  
 Value: 0.977 g/cm<sup>3</sup>  
 Temperature: 35 °C  
 Method: unknown  
 GLP: Yes [ ] No [ ] ? [X]  
 Reference: IUCLID Database

**\*2.4 VAPOUR PRESSURE** *(if more than one, identify the recommended value)*

(a)  
 Value: 1.3 x 10<sup>3</sup> Pa  
 Temperature: 37.7 °C  
 Method: calculated [ ]; measured [X]  
 GLP: Yes [ ] No [ ] ? [X]  
 Remarks:  
 Reference: The Sigma-Aldrich Library of Regulatory and Safety Data

(b)  
 Value: 1.86 hPa  
 Temperature: 20 °C  
 Method: calculated [ ]; measured [X]  
 GLP: Yes [ ] No [ ] ? [X]  
 Remarks:  
 Reference: IUCLID Database

**\*2.5 PARTITION COEFFICIENT log<sub>10</sub>P<sub>ow</sub>**

(a)  
 Log Pow: 2.78  
 Temperature: 25 °C  
 Method: calculated [ ]; measured [X]  
 OECD TG 107  
 GLP: Yes [X] No [ ] ? [ ]  
 Remarks: Test was performed by CITI, Japan  
 Reference: MITI, Japan (1997)

(b)  
 Log Pow: 2.89  
 Temperature: 25 °C  
 Method: calculated [ ]; measured [X]  
 OECD TG 107  
 GLP: Yes [ ] No [X] ? [ ]  
 Remarks:  
 Reference: IUCLID Database

**\*2.6 WATER SOLUBILITY****A. Solubility**

Value: 20 mg/l  
 Temperature: 25 °C  
 Description: Miscible [ ]; Of very high solubility [ ];  
 Of high solubility [ ]; Soluble [ ]; Slightly soluble [X];  
 Of low solubility [ ]; Of very low solubility [ ]; Not soluble [ ]  
 Method: OECD TG 105  
 GLP: Yes [X] No [ ] ? [ ]  
 Remarks: Test was performed by CITI, Japan  
 Reference: MITI, Japan (1997)

## B. pH Value, pKa Value

No ionizable functional group.

### 2.7 FLASH POINT (*liquids*)

Value: 32.2 °C  
 Type of test: Closed cup [ ]; Open cup [ ]; Other [ ]  
 Method: unknown  
 GLP: Yes [ ] No [ ] ? [X]  
 Remarks:  
 Reference: IUCLID Database

### 2.8 AUTO FLAMMABILITY (*solid/gases*)

Value: 680 °C  
 Pressure: 1013 hPa  
 Method: unknown  
 GLP: Yes [ ] No [ ] ? [X]  
 Remarks:  
 Reference: IUCLID Database

### 2.9 FLAMMABILITY

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: IUCLID Database

### 2.10 EXPLOSIVE PROPERTIES

Results: Explosive under influence of a flame [ ]; More sensitive to friction  
 than m-dinitrobenzene [ ]; More sensitive to shock than m-  
 dinitrobenzene [ ]; Not explosive [ ]; Other [X]  
 Method: unknown  
 GLP: Yes [ ] No [ ] ? [X]  
 Remarks: Lower and upper explosion limits are 0.8% and 6.3% vol, respectively.

Reference: IUCLID Database

## 2.11 OXIDISING PROPERTIES

None

## †2.12 OXIDATION: REDUCTION POTENTIAL

No data applicable

## 2.13 ADDITIONAL DATA

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

No data are available

### B. Other data

#### Henry's constant

Results: 830 Pa \* mE+3 \* molE-1

Remarks:

Reference: IUCLID Database

## 3. ENVIRONMENTAL FATE AND PATHWAYS

### 3.1 STABILITY

#### \*3.1.1 PHOTODEGRADATION

No data are available.

#### \*3.1.2 STABILITY IN WATER

Type: Abiotic (hydrolysis) [**X**]; biotic (sediment)[ ]

Half life:

Degradation: Stable at 25 °C after 5 days (exposure time)

Method: OECD TG 111

GLP: Yes [**X**] No [ ] ? [ ]

Test substance: Dicyclopentadiene , purity: 99%

Remarks: Test was performed by CITI, Japan

Reference: MITI, Japan (1997)

#### 3.1.3 STABILITY IN SOIL

No data are available.

### \*3.2 MONITORING DATA (ENVIRONMENTAL)

(a)

Type of Measurement: Background [ ]; At contaminated site [ ]; Other [**X**]

Media: Surface water (sea)  
Results: ND (Detection limits: 0.0002 mg/l) in 2 areas in Japan as of 1978  
Remarks: ND: Not detected  
Reference: Chemicals in the environment, EA, Japan (1979)

(b)

Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]  
Media: Surface water (lake)  
Results: ND (Detection limits: 0.0001 mg/l) in 2 areas in Japan as of 1989  
Remarks: ND: Not detected  
Reference: Chemicals in the environment, EA, Japan (1990)

(c)

Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]  
Media: Surface water (river)  
Results: ND (Detection limits: 0.0001 mg/l) in 2 areas in Japan as of 1989  
Remarks: ND: Not detected  
Reference: Chemicals in the environment, EA, Japan (1990)

(d)

Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]  
Media: Surface water (estuary)  
Results: ND (Detection limits: 0.0002 mg/l) in 10 areas in Japan as of 1989  
Remarks: ND: Not detected  
Reference: Chemicals in the environment, EA, Japan (1990)

(e)

Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]  
Media: Sediment (sea)  
Results: 0.00093 mg/kg (Detection limits: 0.000045 mg/kg) in 2 areas in Japan as of 1978  
ND (Detection limits: 0.0003 mg/kg) in 2 areas in Japan as of 1978  
Remarks: ND: Not detected  
Reference: Chemicals in the environment, EA, Japan (1979)

(f)

Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]  
Media: Sediment (lake)  
Results: ND (Detection limits: 0.005 mg/kg) in 2 areas in Japan as of 1989  
Remarks: ND: Not detected  
Reference: Chemicals in the environment, EA, Japan (1990)

(g)

Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]  
Media: Sediment (estuary)  
Results: ND (Detection limits: 0.005 mg/kg) in 6 areas in Japan as of 1989  
Remarks: ND: Not detected  
Reference: Chemicals in the environment, EA, Japan (1990)

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

#### \*3.3.1 TRANSPORT

No data are available.

#### \*3.3.2 THEORETICAL DISTRIBUTION (FUGACITY CALCULATION)

Media: Air-biota [ ]; Air-biota-sediment-soil-water [X]; Soil-biota [ ]; Water-air [ ]; Water-biota [ ]; Water-soil [ ]; Other [ ]

Method: Fugacity level I [ ]; Fugacity level II [ ]; Fugacity level III [X]; Fugacity level IV [ ]; Other (calculation) [ ]; Other (measurement) [ ]

Results:

Compartment	Release 100% to air	Release 100% to water	Release 100% to soil
Air	99.9 %	28.2 %	68.1 %
Water	0.0 %	71.0 %	0.1 %
Soil	0.1 %	0.0 %	31.8 %
Sediment	0.0 %	0.8 %	0.0 %

Reference: MITI and EA Japan (1997)

### 3.4 IDENTIFICATION OF MAIN MODE OF DEGRADABILITY IN ACTUAL USE

No information are available.

#### \*3.5 BIODEGRADATION

- (a)
- \* Type: aerobic [X]; anaerobic [ ]  
 Inoculum: adapted [ ]; non-adapted [ ]  
 Concentration of the chemical: related to COD [ ]; DOC [ ]; test substance [X]  
 Medium: water [X]; water-sediment [ ]; soil [ ]; sewage treatment [ ]  
 Degradation: 0 % after 2 weeks  
 Results: readily biodeg. [ ]; inherently biodeg. [ ]; under test condition no biodegradation observed [X], other [ ]  
 Method: OECD TG 301C  
 GLP: Yes [X] No [ ] ? [ ]  
 Test substance: Dicyclopentadiene, purity: 99%.  
 Remarks: Test was performed in CITI, Japan.  
 Reference: M.I.T.I.

- (b)
- Type: aerobic [ ]; anaerobic [ ]  
 Inoculum: adapted [ ]; non-adapted [ ]  
 Concentration of the chemical: related to COD [ ]; DOC [ ]; test substance [X]

Medium: water [**X**]; water-sediment [ ]; soil [ ]; sewage treatment [ ]  
 Degradation: 1.6 % after 21 days  
 Results: readily biodeg. [ ]; inherently biodeg. [ ]; under test condition no biodegradation observed [**X**], other [ ]  
 Method: unknown  
 GLP: Yes [ ] No [ ] ? [**X**]  
 Test substance:  
 Remarks:  
 Reference: IUCLID Database

### 3.6 BOD<sub>5</sub>, COD OR RATIO BOD<sub>5</sub>/COD

BOD<sub>5</sub> BOD<sub>5</sub>/BOD  
 Method: unknown  
 Concentration: unknown  
 Value: BOD<sub>5</sub>/ThOD =< 4%  
 GLP: Yes [ ] No [ ] ? [ ]  
 Reference: IUCLID Database

### 3.7 BIOACCUMULATION

Species: Carp (*Cyprinus carpio*)  
 Exposure period: 8 weeks  
 Temperature: 25 °C  
 Concentration: (1) 0.3 mg/l  
 (2) 0.03 mg/l  
 BCF: (1) 112 – 330  
 (2) 58.9 - 384  
 Elimination: Yes [ ] No [ ] ? [ ]  
 Method: OECD TG 305C  
 Type of test: calculated [ ]; measured [ ]  
 static [ ]; semi-static [ ]; flow-through [**X**]; other [ ]  
 GLP: Yes [**X**] No [ ] ? [ ]  
 Test substance: Dicyclopentadien, purity: 99 %  
 Remarks: Test was performed by CITI, Japan.  
 Reference: MITI, Japan (1997)

### 3.8 ADDITIONAL REMARKS

#### A. Sewage treatment

No information are available.

#### B. Other information

None

## 4. ECOTOXICITY

### \*4.1 ACUTE/PROLONGED TOXICITY TO FISH



(a)  
 Type of test: static [ ]; semi-static [X]; flow-through [ ]; other (*e.g. field test*) [ ]  
 open-system [ X ]; closed-system [ ]  
 Species: *Oryzias latipes* (Himedaka)  
 Exposure period: 96 h  
 Results: LC<sub>50</sub> (24h) = 11 mg/l  
 LC<sub>50</sub> (48h) = 6.7 mg/l  
 LC<sub>50</sub> (72h) = 6.7 mg/l  
 LC<sub>50</sub> (96h) = 4.3 mg/l  
 NOEC = mg/l  
 LOEC = mg/l

Analytical  
 monitoring: Yes [ ] No [X] ? [ ]  
 Method: OECD TG 203 (1992)  
 GLP: Yes [ ] No [X] ? [ ]  
 Test substance: As prescribed by 1.1 - 1.4, purity: 94.9%  
 Remarks: Group of ten Himedaka were exposed to nominal concentrations of 1.8, 3.2, 5.6, 10 and 18 mg/l, DMSO & HCO-40 (4:1 weight ratio, 300 mg/l) control and laboratory water control. The LC<sub>50</sub> (96h) was determined to be 4.3 mg/l with a 95 % confidence level of 3.1 mg/l to 5.8 mg/l.

Reference: Environment Agency of JAPAN (1995)

(b)  
 Type of test: static [ ]; semi-static [ ]; flow-through [ ]; other (*e.g. field test*) [ ]  
 open-system [ ]; closed-system [ ]  
 Species: *Ictalurus punctatus*  
 Exposure period: 96 h  
 Results: LC<sub>50</sub> (96h) = 16 mg/l  
 NOEC = mg/l  
 LOEC = mg/l

Analytical  
 monitoring: Yes [ ] No [ ] ? [ ]  
 Method: unknown  
 GLP: Yes [ ] No [ ] ? [X]  
 Test Substance:  
 Remarks:  
 Reference: IUCLID Database

## 4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

### \*A. *Daphnia*

Type of test: static [ ]; semi-static [X]; flow-through [ ]; other (*e.g. field test*) [ ];  
 open-system [X]; closed-system [ ]  
 Species: *Daphnia Magna*  
 Exposure period: 48 h  
 Results: EC<sub>50</sub> (24h) = 8.6 mg/l  
 EC<sub>50</sub> (48h) = 8.0 mg/l  
 NOEC = < 1.8 mg/l

Analytical monitoring: Yes  No  ?   
 Method: OECD TG 202  
 GLP: Yes  No  ?   
 Test substance: As prescribed by 1.1 - 1.4 , purity: 94.9 %  
 Remarks: 20 daphnids (4 replicates; 5 organisms per replicate) were exposed to nominal concentrations of 1.8, 3.2, 5.6, 10 and 18 mg/l, solubilizer (DMSO : HCO-40 = 4:1 weight ratio, 300 mg/l) control and laboratory water control. The EC<sub>50</sub> (48h) was determined to be 8.0 mg/l with a 95 % confidence level of 6.8 mg/l to 9.5 mg/l  
 Reference: Environment Agency of JAPAN (1995)

## B. Other aquatic organisms

No data are available.

### \*4.3 TOXICITY TO AQUATIC PLANTS, e.g. algae

(a)  
 Species: *Selenastrum capricornutum* ATCC 22662  
 Endpoint: Biomass ; Growth rate ; Other   
 Exposure period: 72 h  
 Results: Growth rate EC<sub>50</sub> (72h) = 27.0 mg/l  
 (Endpoint) NOEC = 18 mg/l  
 LOEC = mg/l  
 Analytical monitoring: Yes  No  ?   
 Method: OECD TG 201 (1984)  
 open-system ; closed-system   
 GLP: Yes  No  ?   
 Test substance: As prescribed by 1.1 - 1.4, purity: 94.9 %  
 Remarks: Static test. The EC<sub>50</sub> value for growth rate (% inhibition) was calculated based on 5 nominal concentrations (10, 18, 32.4, 58.3 and 105 mg/l) . Minimal amount of Tween 80 - acetone (1:1) or DMSO - HCO-40 (9:1) is used as solubilizer  
 Reference: Environment Agency of JAPAN (1995)

(b)  
 Species: *Anabaena flos-aquae*  
 Endpoint: Biomass ; Growth rate ; Other   
 Exposure period: 96 h  
 Results: LC<sub>50</sub> (96h) = 22 mg/l  
 (Endpoint) NOEC = mg/l  
 LOEC = mg/l

Analytical monitoring: Yes  No  ?   
 Method: unknown  
 open-system ; closed-system   
 GLP: Yes  No  ?   
 Test substance:  
 Remarks:

Reference: IUCLID Database

#### 4.4 TOXICITY TO BACTERIA

Type: Aquatic [**X**]; Field [ ]; Soil [ ]; Other [ ]  
 Species: *Pseudomonas putida*.  
 Exposure Period:  
 Results: LCEC = 1.14 ppm (TOC)  
 Analytical monitoring: Yes [ ] No [ ] ? [**X**]  
 Method: According to 'Bewertung wassergefährdender Stoffe' Umweltbundesamt, LTWS-Nr. 10.  
 GLP: Yes [**X**] No [ ] ? [ ]  
 Test substance: Dicyclopentadiene-E, purity: 75 %  
 Remarks: Three identical dilution series of Water Accomodation Fraction (WAF) were inoculated with the test organism to give triplicate test cultures at 80% WAF to 0.04% WAF, (Total organic carbon levels of 2.17 ppm to 0.0011 ppm). After incubation the extinctions at 436 nm of each of the test and control cultures were measured. The data obtained from the extinctions was used to determine that the mean concentration of the test material which began to inhibit growth of the test organism was 42% WAF (equivalent to a total organic carbon level of 1.14 ppm)  
 Reference: IUCLID Database

#### 4.5 CHRONIC TOXICITY TO AQUATIC ORGANISMS

##### 4.5.1 CHRONIC TOXICITY TO FISH

No data are available.

##### (\*4.5.2 CHRONIC TOXICITY TO AQUATIC INVERTEBRATES

Type of test: static [ ]; semi-static [**X**]; flow-through [ ]; other (*e.g. field test*) [ ]; open-system [**X**]; closed-system [ ]  
 Species: *Daphnia Magna*  
 Endpoint: Mortality [ ]; Reproduction rate [**X**]; Other [**X**]  
 Exposure period: 21 d  
 Results: Reproduction rate: EC<sub>50</sub> (21 d) = 4.0 mg/l  
 (*Endpoint*) NOEC = 3.2 mg/l  
 LOEC = 10 mg/l  
 Analytical monitoring: Yes [ ] No [**X**] ? [ ]  
 Method: OECD TG 202(1984)  
 GLP: Yes [ ] No [**X**] ? [ ]  
 Test substance: As prescribed by 1.1 - 1.4, purity: 94.9 %  
 Remarks: 40 daphnids (4 replicate; 10 daphnids per replicate) were exposed to 5 concentrations (0.1, 0.32, 1.0, 3.2, 10 mg/l) in dechlorinated tap water (pH: 7.6 to 8.0; Hardness: 48 to 111 mg/l). DMSO and HCO-40 (4:1 mixture, 300 mg/l) is added as solubilizer  
 Reference: Environment Agency of JAPAN (1995)

**4.6 TOXICITY TO TERRESTRIAL ORGANISMS****4.6.1 TOXICITY TO SOIL DWELLING ORGANISMS**

No data are available.

**4.6.2 TOXICITY TO TERRESTRIAL PLANTS**

No data are available.

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

No data are available.

**4.7 BIOLOGICAL EFFECTS MONITORING (INCLUDING BIOMAGNIFICATION)**

No data are available.

**4.8 BIOTRANSFORMATION AND KINETICS**

No data are available.

**4.9 ADDITIONAL REMARKS**

None

**5. TOXICITY****\*5.1 ACUTE TOXICITY****5.1.1 ACUTE ORAL TOXICITY**

Type: LD<sub>0</sub> [ ]; LD<sub>100</sub> [ ]; LD<sub>50</sub> [X]; LDL<sub>0</sub> [ ]; Other [ ]

Species/strain: Rat

Value: 353 mg/kg b.w.:

Method:

GLP: Yes [ ] No [X] ? [ ]

Test substance:

Remarks:

Reference: Toxicol. Appl. Pharmacol., 20, 552, (1971)

Type: LD<sub>0</sub> [ ]; LD<sub>100</sub> [ ]; LD<sub>50</sub> [X]; LDL<sub>0</sub> [ ]; Other [ ]

Species/strain: Rat

Value: 590 mg/kg b.w.:

Method: OECD TG 401

GLP: Yes [X] No [ ] ? [ ]

Test substance: Purity: 71%

Remarks: Necropsy findings consisted of hemorrhage lungs, dark liver and sloughing of non-glandular gastric epithelium.

Reference: Dow Chemical Company (1989) IUCLID Database

### 5.1.2 ACUTE INHALATION TOXICITY

Type: LC<sub>0</sub> [ ]; LC<sub>100</sub> [ ]; LC<sub>50</sub> [X]; LCL<sub>0</sub> [ ]; Other [ ]  
 Species/strain: Rat  
 Exposure time: 4 hours  
 Value: 1000 ppm/4H  
 Method:  
 GLP: Yes [ ] No [X] ? [ ]  
 Test substance:  
 Remarks:  
 Reference: Brit. J. Industr. Med., 27, 1 (1970)

### 5.1.3 ACUTE DERMAL TOXICITY

Type: LD<sub>0</sub> [ ]; LD<sub>100</sub> [ ]; LD<sub>50</sub> [X]; LD<sub>L0</sub> [ ]; Other [ ]  
 Species/strain: Rabbit  
 Value: 5080 mg/kg b.w.  
 Method:  
 GLP: Yes [ ] No [X] ? [ ]  
 Test substance: purity: unknown  
 Remarks:  
 Reference: Toxicol. Appl. Pharmacol., 20, 552, (1971)

### 5.1.4 ACUTE TOXICITY, OTHER ROUTES OF ADMINISTRATION

Type: LC<sub>0</sub> [ ]; LC<sub>100</sub> [ ]; LC<sub>50</sub> [X]; LCL<sub>0</sub> [ ]; Other [ ]  
 LD<sub>0</sub> [ ]; LD<sub>100</sub> [ ]; LD<sub>50</sub> [ ]; LD<sub>L0</sub> [ ]; Other [ ]  
 Species/strain: Rat  
 Route of Administration: i.m. [ ]; i.p. [X]; i.v. [ ]; infusion [ ]; s.c. [ ]; other [ ]  
 Exposure time:  
 Value: 200 mg/kg b.w.  
 Method:  
 GLP: Yes [ ] No [ ] ? [X]  
 Test substance: purity: unknown  
 Remarks:  
 Reference: RTECS Database (NCI Contract PH43-64-886)

## 5.2 CORROSIVENESS/IRRITATION

### 5.2.1 SKIN IRRITATION/CORROSION

Species/strain: Rabbit  
 Results: Highly corrosive [ ]; Corrosive [ ]; Highly irritating [X]; Irritating [ ]  
 Moderate irritating [ ]; Slightly irritating [ ]; Not irritating [ ]  
 Classification: Highly corrosive (causes severe burns)[ ]; Corrosive (causes burns)[ ]  
 Irritating [ ]; Not irritating [ ]  
 Method: Open irritation test  
 GLP: Yes [ ] No [X] ? [ ]

Test substance:	purity: unknown
Remarks:	
Reference:	Achiev. Ind. Hyg. Occp. Med., 10, 61 (1954)
Species/strain:	Rabbit
Results:	Highly corrosive [ ]; Corrosive [ ]; Highly irritating [ ]; Irritating [ ]; Moderate irritating [X]; Slightly irritating [ ]; Not irritating [ ]
Classification:	Highly corrosive (causes severe burns) [ ]; Corrosive (causes burns) [ ]; Irritating [ ]; Not irritating [ ]
Method:	Standard Draize test
GLP:	Yes [ ] No [X] ? [ ]
Test substance:	purity: unknown
Remarks:	Exposure period: 20 mg/24 hours
Reference:	RTECS Database (Prehled Prumyslove Toxikologie, 50 (1986))
Species/strain:	Rabbit
Results:	Highly corrosive [ ]; Corrosive [ ]; Highly irritating [ ]; Irritating [ ]; Moderate irritating [X]; Slightly irritating [ ]; Not irritating [ ]
Classification:	Highly corrosive (causes severe burns)[ ]; Corrosive (causes burns)[ ]; Irritating [ ]; Not irritating [ ]
Method:	Others
GLP:	Yes [ ] No [X] ? [ ]
Test substance:	purity: unknown
Remarks:	
Reference:	IUCLID Database (Am. Ind. Hyg. Ass., 23, 95-107 (1962))

### 5.2.2 EYE IRRITATION/CORROSION

Species/strain:	Rabbit
Results:	Highly corrosive [ ]; Corrosive [ ]; Highly irritating [ ]; Irritating [X]; Moderate irritating [ ]; Slightly irritating [ ]; Not irritating [ ]
Classification:	Irritating [ ]; Not irritating [ ]; Risk of serious damage to eyes [ ]
Method:	open irritation test
GLP:	Yes [ ] No [X] ? [ ]
Test substance:	purity: unknown
Remarks:	Dose: 500 mg/
Reference:	Achiev. Ind. Hyg. Occp. Med., 10, 61 (1954)
Species/strain:	Rabbit
Results:	Highly corrosive [ ]; Corrosive [ ]; Highly irritating [ ]; Irritating [ ]; Moderate irritating [X]; Slightly irritating [ ]; Not irritating [ ]
Classification:	Irritating [ ]; Not irritating [ ]; Risk of serious damage to eyes [ ]
Method:	Standard Draize test
GLP:	Yes [ ] No [X] ? [ ]
Test substance:	purity: unknown
Remarks:	Dose: 500 mg/24 hours
Reference:	RTECS Database (Prehled Prumyslove Toxikologie, 50 (1986))
Species/strain:	Rabbit
Results:	Highly corrosive [ ]; Corrosive [ ]; Highly irritating [ ]; Irritating [ ]; Moderate irritating [ ]; Slightly irritating [X]; Not irritating [ ]

Classification: Irritating [ ]; Not irritating [ ]; Risk of serious damage to eyes [ ]  
 Method: OECD TG 405  
 GLP: Yes [ ] No [X] ? [ ]  
 Test substance: purity: unknown  
 Remarks:  
 Reference: IUCLID Database (Dow Europe Report(1989))

### 5.3 SKIN SENSITISATION

Type: Draize Test  
 Species/strain: Guinea pig  
 Results: Sensitizing [ ]; Not sensitizing [X]; Ambiguous [ ]  
 Classification: Sensitizing [ ]; Not sensitizing [ ]  
 Method:  
 GLP: Yes [ ] No [X] ? [ ]  
 Test substance: purity: unknown  
 Remarks:  
 Reference: IUCLID Database

### \*5.4 REPEATED DOSE TOXICITY

(a)  
 Species/strain: Rat/Crj:CD(SD)  
 Sex: Female [ ]; Male [ ]; Male/Female [X]; No data [ ]  
 Route of Administration: Oral (gavage)  
 Exposure period: Male, 44 days; Female, from 14 days before mating to day 3 of lactation  
 Frequency of treatment:  
 Post exposure observation period:  
 Dose: 0 (Vehicle), 4, 20, 100 mg/kg/day  
 Control group: Yes [X]; No [ ]; No data [ ]; Olive oil  
 Concurrent no treatment [ ]; Concurrent vehicle [X]; Historical [ ]  
 NOEL: 4 mg/kg/day for males and 20 mg/kg/day for females  
 LOEL: 20 mg/kg/day for males and 100 mg/kg/day for females  
 Results: In the 100 mg/kg group, both male and female rats showed slight suppression of body weight gain and decrease in food consumption, and two female rats died. Histopathological examination showed single cell necrosis in the liver, and hyaline droplets and basophilic change in the tubular epithelium of the kidneys in male rats. The weights of these organs were also increased. An increase of fatty droplets in the fascicular zone of the adrenals was observed in both male and female rats. Blood chemistry examination in male rats showed increases in GOT and GPT. Similar histopathological changes were found in the kidney of the 4 and 20 mg/kg male rats and in the adrenals of the 20 mg/kg male rats. There were no hematological changes ascribable to the compound in any group.  
 Method: OECD Combined Repeat Dose and Reproductive/Developmental Toxicity Screening Test  
 GLP: Yes [X] No [ ] ? [ ]

Test substance:	Dicyclopentadiene, purity: 94.65%
Reference:	MHW, Japan (1997)
(b)	
Species/strain:	Rat/F-344
Sex:	Female [ <input type="checkbox"/> ]; Male [ <input type="checkbox"/> ]; Male/Female [ <input checked="" type="checkbox"/> ]; No data [ <input type="checkbox"/> ]
Route of Administration:	Inhalation
Exposure period:	Male, 13 weeks
Frequency of treatment:	5 days/week
Dose:	0, 1.0, 5.1, 51 ppm (6 hours/day)
Control group:	Yes [ <input checked="" type="checkbox"/> ]; No [ <input type="checkbox"/> ]; No data [ <input type="checkbox"/> ]; Olive oil Concurrent no treatment [ <input type="checkbox"/> ]; Concurrent vehicle [ <input checked="" type="checkbox"/> ]; Historical [ <input type="checkbox"/> ]
NOEL:	51 ppm (6 hrs/day)
LOEL:	
Results:	No signs of toxicity were seen in the females. Histopathological examination of kidneys in the males revealed dose-related tubular hyperplasia, interstitial nephritis and glomerular basement membrane thickening. These kidney toxicities are male rat specific.
Method:	unknown
GLP:	Yes [ <input type="checkbox"/> ] No [ <input type="checkbox"/> ] ? [ <input checked="" type="checkbox"/> ]
Test substance:	Dicyclopentadiene, purity: unknown
Reference:	Dodd, D.E. et al., Report to Exxon (1982)
(c)	
Species/strain:	Dog/beagle
Sex:	Female [ <input type="checkbox"/> ]; Male [ <input checked="" type="checkbox"/> ]; Male/Female [ <input type="checkbox"/> ]; No data [ <input type="checkbox"/> ]
Route of Administration:	Inhalation
Exposure period:	89 days
Frequency of treatment:	5 days/week
Dose:	0, 8.9, 23.5, 32.4 ppm (7 hrs/day)
Control group:	Yes [ <input checked="" type="checkbox"/> ]; No [ <input type="checkbox"/> ]; No data [ <input type="checkbox"/> ]; Olive oil Concurrent no treatment [ <input type="checkbox"/> ]; Concurrent vehicle [ <input checked="" type="checkbox"/> ]; Historical [ <input type="checkbox"/> ]
NOEL:	32.4 ppm (7 hrs/day)
LOEL:	
Results:	No significant signs of toxicity were seen during or after the exposure period.
Method:	unknown
GLP:	Yes [ <input type="checkbox"/> ] No [ <input type="checkbox"/> ] ? [ <input checked="" type="checkbox"/> ]
Test substance:	Dicyclopentadiene, purity: unknown
Reference:	Kinhead, E.R. et al., Toxicol. Appl. Pharmacol., 20, 552 (1971)

## \*5.5 GENETIC TOXICITY IN VITRO

### A. BACTERIAL TEST

Type:	Bacterial gene mutation assay
System of testing:	S. typhimurium TA98, TA100, TA1535, TA1537, TA1538





No data are available.

### \*5.8 TOXICITY TO REPRODUCTION

Type: Fertility [  ]; One-generation study [  ]; Two-generation study [  ];  
Other [  ]  
Species/strain: Rat/Crj:CD(SD)  
Sex: Female [  ]; Male [  ]; Male/Female [  ]; No data [  ]  
Route of Administration: Oral (gavage)  
Exposure period: Male, 44 days; Female, from 14 days before mating to day 3 of lactation  
Frequency of treatment:  
Post exposure observation period:  
Premating exposure period: male: , female:  
Duration of the test:  
Doses: 0 (Vehicle), 4, 20, 100 mg/kg/day  
Control group: Yes [  ]; No [  ]; No data [  ]; Olive oil  
Concurrent no treatment [  ]; Concurrent vehicle [  ]; Historical [  ]  
NOEL Parental: 100 mg/kg/day for male; 20 mg/kg/day for female  
NOEL F1 Offspring: 20 mg/kg/day  
NOEL F2 Offspring:  
Results: The compound had no reproductive parameters such as the mating index, the fertility index, gestation length, number of corpora lutea or implantations, the implantation index, the gestation index, the delivery index or parturition. Two dams of the 100 mg/kg group, however, did not nurse their litters and lost all of them within 2 days. There were no significant differences in number of offspring or live offspring at birth, sex ratio or the live birth index. No abnormal findings ascribable to the compound were found for external features, clinical signs, or on necropsy of the offspring.  
Method: OECD Combined Repeat Dose and Reproductive/Developmental Toxicity Screening Test  
GLP: Yes [  ] No [  ] ? [  ]  
Test substance: Dicyclopentadiene, purity: 94.65%  
Reference: MHW, Japan (1997)

### \*5.9 DEVELOPMENTAL TOXICITY/ TERATOGENICITY

Species/strain: SD Rat (20 female pregnant rats)  
Sex: Female [  ]; Male [  ]; Male/Female [  ]; No data [  ]  
Route of Administration: Oral (Diet).  
Duration of the test: days 6 - 15 of gestation  
Exposure period:  
Frequency of treatment:  
Doses: 0, 80, 250, 750 mg/kg/day  
Control group: Yes [  ]; No [  ]; No data [  ];

Concurrent no treatment [  ]; Concurrent vehicle [**X**]; Historical [  ]

NOEL Maternal  
 Toxicity: 750 mg/kg/day  
 NOEL teratogenicity: 750 mg/kg/day  
 Results: On day 19, the dams were sacrificed and examined; each uterus was examined for implantation sites, placement in uterine horns, number of live and dead fetuses and resorptions. Fetuses were examined for soft tissue changes and skeletal abnormalities. No compound - related gross pathological effects or changes in reproductive performance were seen in the dams. There were no visceral or skeletal malformations or changes in sex ratio in the fetuses. Only dietary variations were observed.

Method:  
 GLP: Yes [  ] No [  ] ? [**X**]  
 Test substance: Purity: unknown  
 Reference: ECETOC Joint Assessment of Commodity Chemicals No.19 (Hart, E.R., NTIS Rep. No. AD-AO 58323 (1980))

## 5.10 OTHER RELEVANT INFORMATION

### A. Specific toxicities

No information are available.

### B. Toxicodynamics, toxicokinetics

No data are available.

## \* 5.11 EXPERIENCE WITH HUMAN EXPOSURE

No information are available.

## 6. REFERENCES



**EXTRACT FROM IRPTC LEGAL FILES**

file: 17.01 LEGAL rn : 100091  
 systematic name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name : Dicyclopentadiene  
 reported name : Dicyclopentadiene  
 cas no : 77-73-6 rtecs no : PC1050000  
 area : ARG type : REG

```
-----
|subject|specification|descriptor|
|-----+-----+-----|
| AIR   |   OCC   |   MPC   |
|-----+-----+-----|
-----
```

8H-TWA : 30 MG/M3 (5 PPM)

entry date: OCT 1991

effective date: 29MAY1991

title: LIMIT VALUES FOR CHEMICAL SUBSTANCES IN THE WORKING ENVIRONMENT-RESOLUTION NO. 444/1991 OF THE MINISTRY OF WORK AND SOCIAL SECURITY (AMENDING REGULATION DECREE NO. 351/1979 UNDER LAW NO. 19587/1972: HYGIENE AND SAFETY AT WORK)  
 original : ARGOB\*, BOLETIN OFICIAL DE LA REPUBLICA ARGENTINA (ARGENTIAN OFFICIAL BULLETIN), 24170 , I , 1 , 1979  
 amendment: ARGOB\*, BOLETIN OFICIAL DE LA REPUBLICA ARGENTINA (ARGENTIAN OFFICIAL BULLETIN), 27145 , I , 4 , 1991

\*\*\*\*\*

file: 17.01 LEGAL rn : 300575  
 systematic name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name : Dicyclopentadiene  
 reported name : Dicyclopentadiene  
 cas no : 77-73-6 rtecs no : PC1050000  
 area : CAN type : REG

```
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|subject|specification|descriptor|
|-----+-----+-----|
| AIR   |   OCC   |   TLV   |
|-----+-----+-----|
-----
```

TWA: 5 ppm, 30 mg/m3. Prescribed by the Canada Occupational Safety and Health Regulations, under the Canada Labour Code (administered by the Department of Employment and Immigration). The regulations state that no employee shall be exposed to a concentration of an airborne chemical agent in excess of the value for that chemical agent adopted by ACGIH (American Conference of Governmental Industrial Hygienists) in its publication entitled: "Threshold Limit Value and Biological Exposure Indices for 1985-86". The regulations also state that the employer shall, where a person is about to enter a confined space, appoint a qualified person to verify by means of tests that the concentration of any chemical agent or combination of chemical agents will not result in the exposure of the person to a concentration in excess of the value indicated above. These regulations prescribe standards whose enforcement will provide a safe and healthy workplace.

entry date: OCT 1994

effective date: 24MCH1994

amendment: CAGAAK, CANADA GAZETTE PART II, 128 , 7 , 1513 , 1994

\*\*\*\*\*

file: 17.01 LEGAL rn : 301817  
 systematic name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-

common name :Dicyclopentadiene  
 reported name :Dicyclopentadiene  
 cas no :77-73-6 rtecs no :PC1050000  
 area : CAN type : REG

```

-----
|subject|specification|descriptor|
|-----+-----+-----|
| TRNSP |          | CLASS |
| LABEL |          | RQR   |
| PACK  |          |       |
-----

```

Schedule II, List II - Dangerous Goods other than Explosives: PIN (Product Identification No.): UN2048. Class (3): Flammable liquids. Packing group III, (I=Great danger, III=Minor danger). Passenger Vehicles: 60 L. Prescribed by the Transportation of Dangerous Goods Regulations, under the Transportation of Dangerous Goods Act (administered by the Department of Transport). The act and regulations are intended to promote safety in the transportation of dangerous goods in Canada, as well as provide comprehensive regulations applicable to all modes of transport accross Canada. These are based on United Nations recommendations. The act and regulations should be consulted for details. Information is entered under the proper shipping name found in the regulations; this may include general groups of chemical substances.  
 entry date: OCT 1994 effective date: 02DEC1993

amendment: CAGAAK, CANADA GAZETTE PART II, 127 , 25 , 4056 , 1993

\*\*\*\*\*

file: 17.01 LEGAL rn : 302852  
 systematic name:4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name :Dicyclopentadiene  
 reported name :Dicyclopentadiene  
 cas no :77-73-6 rtecs no :PC1050000  
 area : CAN type : REG

```

-----
|subject|specification|descriptor|
|-----+-----+-----|
| USE   | OCC          | RQR   |
| STORE |              |       |
| LABEL |              |       |
-----

```

Ingredient Disclosure List - Concentration: 1% weight/weight. The Workplace Hazardous Materials Information System (WHMIS) is a national system providing information on hazardous materials used in the workplace. WHMIS is implemented by the Hazardous Products Act and the Controlled Products Regulations (administered by the Department of Consumer and Corporate Affairs). The regulations impose standards on employers for the use, storage and handling of controlled products. The regulations also address labelling and identification, employee instruction and training, as well as the upkeep of a Materials Safety Data Sheet (MSDS). The presence in a controlled product of an ingredient in a concentration equal to or greater than specified in the Ingredient Disclosure List must be disclosed in the Safety Data Sheet.  
 entry date: APR 1991 effective date: 31DEC1987

amendment: CAGAAK, CANADA GAZETTE PART II, 122 , 2 , 551 , 1988

\*\*\*\*\*

file: 17.01 LEGAL rn : 401552  
 systematic name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name : Dicyclopentadiene  
 reported name : Dicyclopentadiene  
 cas no : 77-73-6 rtecs no : PC1050000  
 area : CSK type : REG

```

-----
|subject|specification|descriptor|
|-----+-----+-----|
| CLASS |           | CLASS |
-----

```

THIS SUBSTANCE IS CLASSIFIED AS POISON.

entry date: AUG 1994

effective date: FEB1992

title: GOVERNMENT PROVISION NO. 192 ON POISONS AND ANOTHER SUBSTANCES  
 HARMFUL TO HUMAN HEALTH

original : SZCSR\*, SBIRKA ZAKONU CESKOSLOVENSKE SOCIALISTICKE  
 REPUBLIKY (COLLECTION OF THE LAW OF CZECHOSLOVAK SOCIALIST  
 REPUBLIC), , 42 , 1217 , 1988

amendment: SZCFR\*, , , 6 , 153 , 1992

\*\*\*\*\*

file: 17.01 LEGAL rn : 522717  
 !!! WARNING - not original IRPTC record - WARNING !!!  
 systematic name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name : Dicyclopentadiene  
 reported name : Dicyclopentadiene  
 cas no : 77-73-6 rtecs no : PC1050000  
 area : DEU type : REG

```

-----
|subject|specification|descriptor|
|-----+-----+-----|
| AQ    |           | CLASS |
| USE   | INDST    | RQR   |
-----

```

This substance is classified as severely hazardous to water (Water Hazard Class: WHC 3). (There are 3 water hazard classes: WHC 3 = severely hazardous; WHC 2 = hazardous; WHC 1 = moderately hazardous; and the classification as "not hazardous to water"). The purpose of the classification is to identify the technical requirements of industrial plants which handle substances hazardous to water.

entry date: SEP 2001

effective date: 01JUN1999

title: Administrative Order relating to Substances Hazardous to Water  
 (Verwaltungsvorschrift wassergefaehrdende Stoffe)

original : BUANZ\*, Bundesanzeiger, 51 , 98a , 1 , 1999

\*\*\*\*\*

file: 17.01 LEGAL rn : 540301  
 !!! WARNING - not original IRPTC record - WARNING !!!  
 systematic name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name : Dicyclopentadiene  
 reported name : Dicyclopentadiene  
 cas no : 77-73-6 rtecs no : PC1050000



area : DEU type : REC

```
-----
|subject|specification|descriptor|
|-----+-----+-----|
| AIR   |   OCC   |   MAK   |
|-----+-----+-----|
-----
```

MAK value (8-hour time-weighted average): 0.5 ml/m<sup>3</sup> (ppm) or 2.7 mg/m<sup>3</sup> (20 C, 1013 hPa). Peak limitation category I: Substance for which local irritant effects determine the MAK value; excursion factor = 1 (peak level is 1 x MAK). - Pregnancy risk group IIc: No pregnancy risk group classification due to the absence of adequate data. - Applies to Dicyclopentadiene (endo- and exo-).  
entry date: MAY 2001

title: List of MAK and BAT Values 2000. Maximum Concentrations and Biological Tolerance Values at the Workplace. (MAK- und BAT-Werte-Liste 2000. Maximale Arbeitsplatzkonzentrationen und Biologische Arbeitsstofftoleranzwerte.)  
original : MPGFDf, Mitteilung der Senatskommission zur Pruefung gesundheitsschaedlicher Arbeitsstoffe, 36 , , , 2000

\*\*\*\*\*

file: 17.01 LEGAL rn : 1010175  
systematic name:4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
common name :Dicyclopentadiene  
reported name :Dicyclopentadiene  
cas no :77-73-6 rtecs no :PC1050000  
area : MEX type : REG

```
-----
|subject|specification|descriptor|
|-----+-----+-----|
| AIR   |   OCC   |   MXL   |
|-----+-----+-----|
-----
```

AT ANY WORKPLACE WHERE THIS SUBSTANCE IS PRODUCED, STORED OR HANDLED A MAXIMUM PERMISSIBLE LEVEL OF 30MG/M<sup>3</sup> (5PPM) MUST BE OBSERVED FOR A PERIOD OF 8 HOURS.

entry date: DEC 1991 effective date: 28MAY1984

title: INSTRUCTION NO.10 RELATED TO SECURITY AND HYGIENIC CONDITIONS AT WORKPLACES. (INSTRUCTIVO NO. 10, RELATIVO A LAS CONDICIONES DE SEGURIDAD E HIGIENE DE LOS CENTROS DE TRABAJO).  
original : DOMEX\*, DIARIO OFICIAL, , , , 1984

\*\*\*\*\*

file: 17.01 LEGAL rn : 1120944  
systematic name:4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
common name :Dicyclopentadiene  
reported name :Dicyclopentadiene  
cas no :77-73-6 rtecs no :PC1050000  
area : RUS type : REG

```
-----
|subject|specification|descriptor|
|-----+-----+-----|
| AIR   |   OCC   |   MAC   |
|       |         |   CLASS |
|-----+-----+-----|
-----
```

CLV: 1.0MG/M3 (VAPOUR) HAZARD CLASS: II  
 entry date: MAY 1990

effective date: 01JAN1989

amendment: GOSTS\*, GOSUDARSTVENNYI STANDART SSSR (STATE STANDARD OF  
 USSR), 12.1.005 , , , 1988

\*\*\*\*\*

file: 17.01 LEGAL rn : 1121826  
 systematic name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name : Dicyclopentadiene  
 reported name : Dicyclopentadiene  
 cas no : 77-73-6 rtecs no : PC1050000  
 area : RUS type : REG

subject	specification	descriptor
AIR	AMBI	PSL

0.01MG/M3 1X/D

entry date: SEP 1985

effective date: DEC1983

amendment: OBUAV\*, ORIENTIROVOCHNYE BEZOPASNYE UROVNI VOZDEISTVIA (OBUV)  
 ZAGRAZNI AIUSHCHIKH VESHCHESTU V ATMOSFERNOM VOZDUKHE  
 NASEKENNYKH MEST (TENTATIVE SAFE EXPOSURE LIMITS (TSEL) OF  
 CONTAMINANTS IN AMBIENT AIR OF RESIDENTIAL AREAS), 2947-83 , ,  
 , 1983

\*\*\*\*\*

file: 17.01 LEGAL rn : 1122909  
 systematic name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name : Dicyclopentadiene  
 reported name : Dicyclopentadiene  
 cas no : 77-73-6 rtecs no : PC1050000  
 area : RUS type : REG

subject	specification	descriptor
AQ	SURF	MAC
		CLASS

0.015MG/L HAZARD CLASS: III

entry date: JUL 1990

effective date: 1JAN1989

amendment: SPNPV\*, SANITARNYE PRAVILA I NORMY OKHRANY POVERKHNOSTNYKH  
 VOD OT ZAGRIAZNENIA (HEALTH REGULATION AND STANDARDS OF  
 SURFACE WATER PROTECTION FROM CONTAMINATION), 4630-88 , , ,  
 1988

\*\*\*\*\*

file: 17.01 LEGAL rn : 1340745  
 systematic name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name : Dicyclopentadiene  
 reported name : Dicyclopentadiene

cas no :77-73-6 rtecs no :PC1050000  
 area : USA type : REC

```
-----
|subject|specification|descriptor|
|-----+-----+-----|
| AIR   |   OCC   |   TLV   |
|-----+-----+-----|
```

Time Weighted Avg (TWA) 5 ppm, 27 MG/M3; Summary - THIS THRESHOLD LIMIT VALUE IS INTENDED FOR USE IN THE PRACTICE OF INDUSTRIAL HYGIENE AS A GUIDELINE OR RECOMMENDATION IN THE CONTROL OF POTENTIAL HEALTH HAZARDS.  
 entry date: DEC 1991 effective date: 1989

title: THRESHOLD LIMIT VALUES  
 original : ACGIH\*, AMERICAN CONFERENCE OF GOVERNMENT INDUSTRIAL HYGIENISTS, , , 11 , 1989  
 amendment: ACGIH\*, AMERICAN CONFERENCE OF GOVERNMENT INDUSTRIAL HYGIENISTS, , , 11 , 1991

\*\*\*\*\*

file: 17.01 LEGAL rn : 1408543  
 systematic name:4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name :Dicyclopentadiene  
 reported name :Dicyclopentadiene  
 cas no :77-73-6 rtecs no :PC1050000  
 area : EEC type : REG

```
-----
|subject|specification|descriptor|
|-----+-----+-----|
| FOOD  |             | RQR   |
| GOODS |             | MXL   |
| GOODS |             | PRMT  |
|-----+-----+-----|
```

THE SUBSTANCE IS INCLUDED IN THE LIST OF MONOMERS AND OTHER STARTING SUBSTANCES, WHICH MAY CONTINUE TO BE USED FOR THE MANUFACTURE OF PLASTICS AND ARTICLES INTENDED TO COME INTO CONTACT WITH FOODSTUFFS UNTIL 1 JANUARY 1997 PENDING A DECISION ON THEIR INCLUSION IN THE LIST OF AUTHORIZED SUBSTANCES. THE USE OF THE SUBSTANCE IS SUBJECT TO THE RESTRICTIONS SPECIFIED THEREIN. PLASTIC MATERIALS AND ARTICLES SHALL NOT TRANSFER THEIR CONSTITUENTS TO FOODSTUFFS IN QUANTITIES EXCEEDING 10MG/DM2 OF SURFACE AREA OF MATERIAL OR ARTICLE OR 60 MG/KG OF FOODSTUFFS IN THE SPECIFIED CASES. VERIFICATION OF COMPLIANCE WITH THE MIGRATION LIMITS SHALL BE CARRIED OUT IN ACCORDANCE WITH DIRECTIVES 82/711/EEC AND 85/572/EEC.

entry date: SEP 1995 effective date: 01JAN1991

title: COMMISSION DIRECTIVE OF 23 FEBRUARY 1990 RELATING TO PLASTICS MATERIALS AND ARTICLES INTENDED TO COME INTO CONTACT WITH FOODSTUFFS (90/128/EEC)  
 original : OJEC\*\*, OFFICIAL JOURNAL OF THE EUROPEAN COMMUNITIES, L75 , , 19 , 1990  
 amendment: OJEC\*\*, OFFICIAL JOURNAL OF THE EUROPEAN COMMUNITIES, L90 , , 26 , 1993

\*\*\*\*\*

file: 17.01 LEGAL rn : 1470102  
 !!! WARNING - not original IRPTC record - WARNING !!!

systematic name:4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name :Dicyclopentadiene  
 reported name :3A,4,7,7A-TETRAHYDRO-4,7-METHANOINDENE  
 cas no :77-73-6 rtecs no :PC1050000  
 area : EEC type : REG

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|subject|specification|descriptor|
|-----+-----+-----|
| MANUF |      INDST      |    CLASS |
| IMPRT |      INDST      |    CLASS |
-----

```

The substance is included in a list of existing substances produced or imported within the Community in quantities exceeding 1000 tonnes per year. - A system of data reporting by any manufacturer who has produced or any importer who has imported the substance, as such or in a preparation, in quantities exceeding 10 tonnes per year is established.  
 entry date: AUG 1999 effective date: 04JUN1993

title: Council Regulation (EEC) No 793/93 of 23 March 1993 on the evaluation and control of the risks of existing substances  
 original : OJECFC, Official Journal of the European Communities, L84 , , 1 , 1993

\*\*\*\*\*

file: 17.01 LEGAL rn : 1661862  
 !!! WARNING - not original IRPTC record - WARNING !!!  
 systematic name:4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name :Dicyclopentadiene  
 reported name :Dicyclopentadiene  
 cas no :77-73-6 rtecs no :PC1050000  
 area : IMO type : REC

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|subject|specification|descriptor|
|-----+-----+-----|
| TRNSP |      MARIN      |    CLASS |
| LABEL |                  |    RQR   |
| PACK  |                  |    RQR   |
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```

UN No. 2048. Class: 3 = Flammable liquid. Packing group: III = Low danger.  
 entry date: NOV 2000 effective date: 01JAN2001

title: IMDG Code - Dangerous Goods List  
 original : IMDGC\*, International Maritime Dangerous Goods Code, Amendment 30-00, Volume 2 , , , 2000

\*\*\*\*\*

file: 17.01 LEGAL rn : 1760862  
 !!! WARNING - not original IRPTC record - WARNING !!!  
 systematic name:4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-  
 common name :Dicyclopentadiene  
 reported name :Dicyclopentadiene  
 cas no :77-73-6 rtecs no :PC1050000  
 area : UN type : REC

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-----  
|subject|specification|descriptor|  
|-----+-----+-----|  
| TRNSP |                | CLASS |  
| LABEL |                | RQR   |  
| PACK  |                | RQR   |  
|-----+-----+-----|
```

UN No. 2048. Class: 3 = Flammable liquid. Packing group: III = Low  
danger.

entry date: NOV 2000

title: UN Orange Book - Dangerous Goods List

original : !RTDGFK, Recommendations on the Transport of Dangerous Goods  
prepared by the United Nations Committee of Experts on the  
Transport of Dangerous Goods, 11th revised ed., , , 1999

