

*magna* 48 h immobility data (600 mg/l). The assessment factor of 1000 used to an acute toxicity data to determine PNEC, according to the OECD Provisional Guidance for Initial Assessment of Aquatic Effects, because only one acute toxicity data is available among algae, cladocera and fishes. Thus, PNEC of the chemical is determined as 0.6 mg/l, tentatively. Thus, PEC / PNEC is 0.0072. Effects of the chemical on aquatic ecosystems are of low concern at present.

Pentaerythritol was not mutagenic in bacterial and chromosomal aberration tests in vitro. The chemical is not considered as an irritant to the skin and the eyes, nor as a sensitizer. In a combined repeat dose and reproductive/developmental toxicity screening test, both male and female rats showed only soft faeces and diarrhoea. The chemical did not show any toxicity to parents and offsprings. The no observed effect levels were 100 mg/kg/day for repeated dose toxicity and 1000 mg/kg/day for reproductive/developmental toxicity.

For human health, the risk for workers is expected to be low because the margin of safety is 83.3 as the worst case. The risks for 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  $6.98 \times 10^5$  or  $7.38 \times 10^6$ . Therefore, it is currently considered of low potential risk and low priority for further work.

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

Environmental Concentration ( $PEC_{local}$ ) is calculated to be  $5.1 \times 10^{-5}$  mg/L, employing the following calculation model and dilution factor of 660 (See Appendix 1).

$$\frac{\text{Amount of release } (5 \times 10^8 \text{ mg/y})}{\text{Volume of effluent } (1.5 \times 10^{10} \text{ L/y}) \times \text{Dilution Factor } (660)}$$

### 3.2 Effects on the Environments

#### 3.2.1 Effects on aquatic organisms

Acute and chronic toxicity data of pentaerythritol to aquatic organisms are summarized below (Table 2). Toxicity of this chemical to aquatic organisms is very low, because all the toxicity data are higher than 100 mg/l. Predicted No Effect Concentration (PNEC) of this chemical was determined using a *Daphnia magna* 48 h immobility data (600 mg/l) found in a reference (Table 2). The assessment factor of 1000 is used to an acute 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 only one acute toxicity data is available among algae, cladocera and fishes.

From acute toxicity data:  $PNEC = 600 / 1000 = 0.6$  mg/l

Thus, PNEC of pentaerythritol is determined as 0.6 mg/l, tentatively.

**Table 1**  
Acute and chronic toxicity data of pentaerythritol to aquatic organisms at different trophic levels. The data (ref. 1) by the Environmental Agency of Japan were tested based on OECD Test Guide Lines.

Species	Endpoint	Conc. (mg/l)	Remarks
<i>Selenastrum capricornutum</i> (algae)	Gro 72 h EC50	>1000	a, 3)
	do. 72 h NOEC	> 1000	c, 3)
<i>Daphnia magna</i> (Water flea)	Imm 24 h EC50	>1000	a, 3)
	Rep 21 d NOEC	>1000	c, 3)
	Imm 48 h EC50	600	a, 4), A
	Mor 48 h LC50	33600	a, 5)
<i>Oryzias latipes</i> (fish, Medaka)	Mor 24 h LC50	>100	a, 3)
	Mor 48 h LC50	> 100	a, 3)
	Mor 72 h LC50	> 100	a, 3)
	Mor 96 h LC50	> 100	a, 3)

Notes: Gro; growth, Mor; mortality, Rep; reproduction, No. 3- 5), Reference number, A), C); selected as the lowest value respectively among the acute or chronic toxicity data of algae, cladocera (water flea) and fishes to determine PNEC of pentaerythritol.

#### 3.2.2 Terrestrial effects

No data available.

#### 3.2.3 Other effects

No data available.

### 3.3 Initial Assessment for the Environment

PNEC of this chemical is calculated as 0.6 mg/l, tentatively.

The highest PEC from Japanese local exposure scenario (manufacturer A) is  $4.3 \times 10^{-3}$  mg/l.

Thus,  $PEC_{local} / PNEC = 4.3 \times 10^{-3} / 0.6 = 0.0072 < 1$

Effects of this chemical on aquatic ecosystems is at low concern at present.

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

### References

- 1) Struijjs, J., Stoltenkamp, J. (1980) Headspace determination of evolved carbon dioxide in a biodegradability screening test. *Ecotoxicol. Environ. Saf.*, 19, 204-211.
- 2) Gerike, P., Sebesta, G., Herkelmann, H. (1979) A correlation study of biodegradability determination with various chemicals in various tests. *Ecotoxicol. Environ. Saf.*, 3, 159-173.
- 3) Toxicity data by the Environment Agency of Japan. The tests were conducted based on OECD Test Guide Lines.
- 4) Walton, J.R, and Davis, E.M. (1980) Toxicology and fate of selected chemicals in aquatic ecosystems. University of Texas, School of Public Health, Inst. of Environ, Health, Houston, TX: 91 p.
- 5) Bringmann, G. and Kuhn, R. (1982) Results of toxic action of water pollutants on *Daphnia magna* Straus tested by an improved standardized procedure. *Z. Wasser Abwasser-Forsch.* 15 (1), 1-6 (GER) (ENG ABS)

## 4. HUMAN HEALTH

### 4.1 Human Exposure

#### 4.1.1 Occupational exposure

Pentaerythritol is produced in closed systems. Occupational exposure in production sites is expected in bag filling operation. The major route of exposure is considered to be inhalation. The bag filling operation was done for 8 hours per day using automatic filling machine with local exhaust ventilation. The workers wear goggles, protective gloves, and dust masks. The atmosphere concentrations at bag filling operation area were measured at a production facility, using light scattering dust monitor. The average daily intake without protection equipment such as mask was calculated as 1.2 mg/kg/day from the average atmosphere concentration of  $8.5 \text{ mg/m}^3$  (maximum value;  $20.3 \text{ mg/m}^3$  and minimum value;  $0.35 \text{ mg/m}^3$ ), body weight of 70 kg and respiratory volume of  $1.25 \text{ m}^3/\text{hour}$ .

## 要 旨

### 試験委託者

環境庁

### 表 題

1, 3-ベンゼンジメタンアミンの藻類 (*Selenastrum capricornutum*) に対する生長阻害試験

### 試験番号

9 B 4 4 9 G

### 試験方法

本試験は、OECD 化学品テストガイドライン No. 201「藻類生長阻害試験」(1984年)に準拠して実施した。

- 1) 被験物質: 1, 3-ベンゼンジメタンアミン
- 2) 暴露方式: 止水式, 振とう培養 (100rpm)
- 3) 供試生物: *Selenastrum capricornutum* (ATCC22662)
- 4) 暴露期間: 72時間
- 5) 試験濃度 (設定値):  
対照区, 1.00, 2.19, 4.78, 10.5, 22.9, 50.0 mg/L  
(公比: 2.2)
- 6) 試験液量: 100 mL (OECD培地) / 容器
- 7) 連数: 3 容器 / 濃度区
- 8) 初期細胞濃度:  $1 \times 10^4$  cells/mL
- 9) 試験温度:  $23 \pm 2$  °C
- 10) 照明: 4000 lux (±20%の変動内, フラスコ液面付近) で連続照明
- 11) 分析法: HPLC法

## 結 果

### 1) 試験液中の被験物質濃度

被験物質の測定濃度が開始時において設定値の±20%を超えたものがなかったため、下記の生長阻害濃度の算出には設定値を採用した。

### 2) 生長曲線下面積の比較による阻害濃度

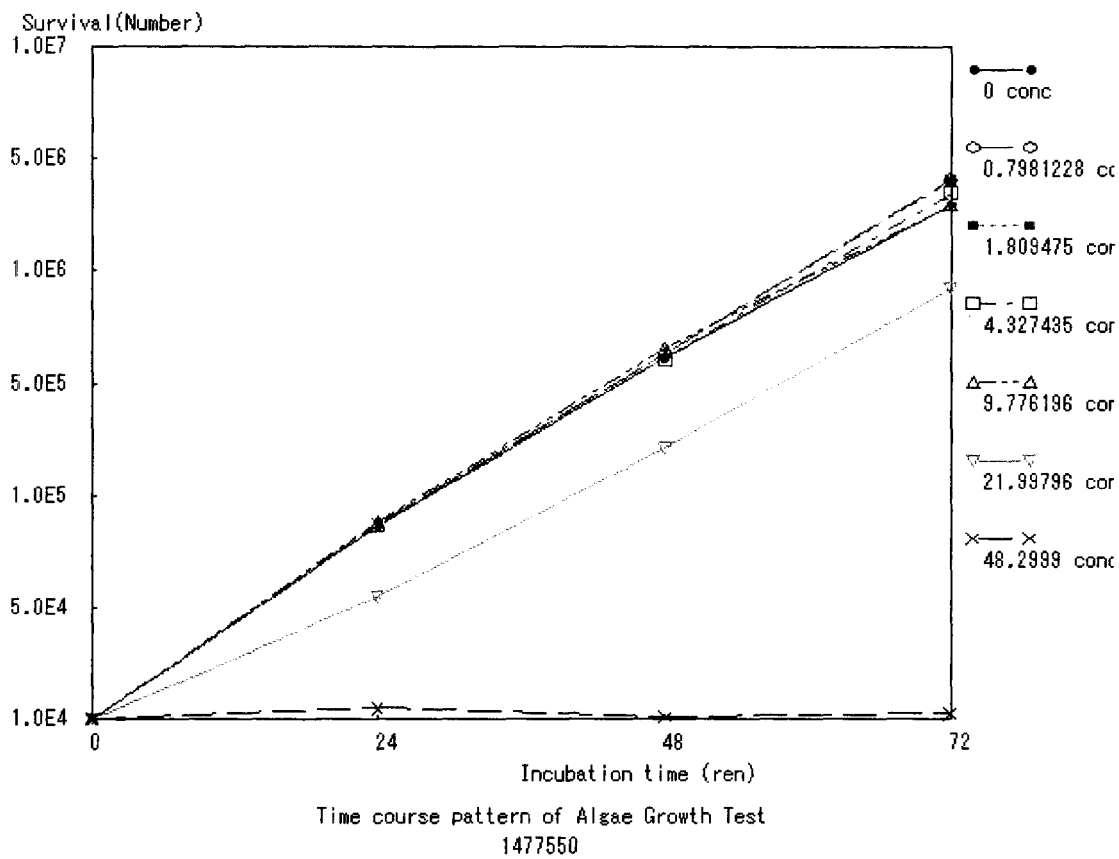
50%生長阻害濃度 Ebc50 (0-72) : 20.3 mg/L (95%信頼区間: 算出不可)  
最大無作用濃度 NOECb (0-72) : 10.5 mg/L

### 3) 生長速度の比較による阻害濃度

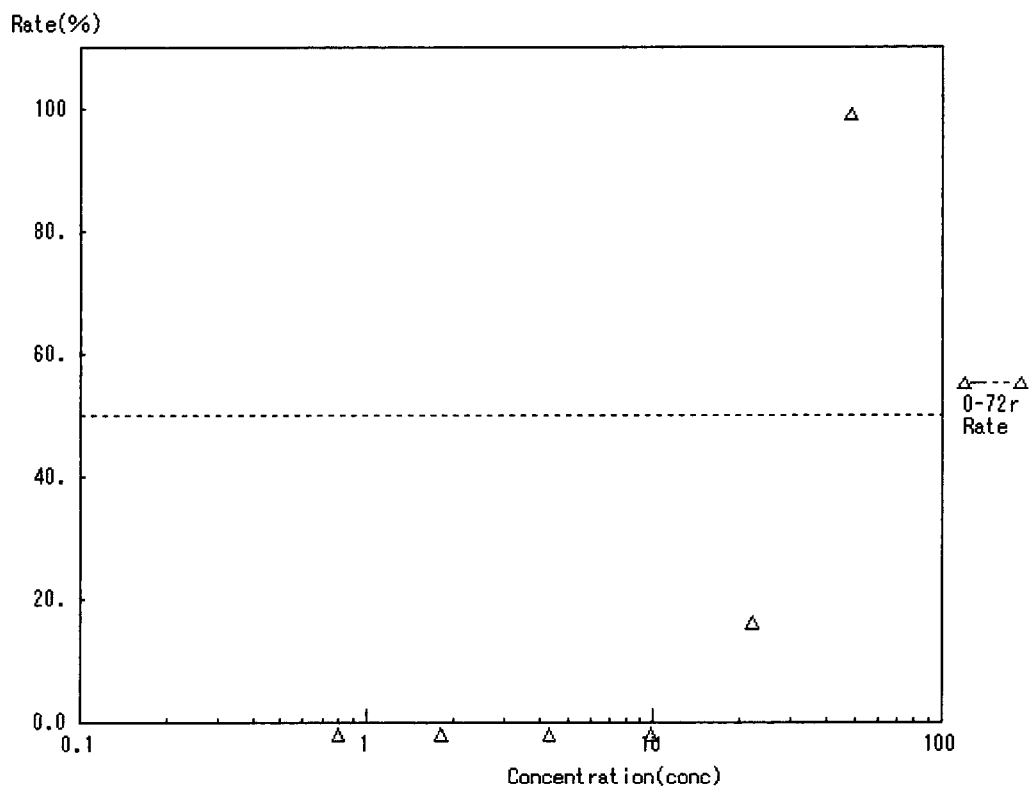
50%生長阻害濃度 ErC50 (24-48) : 32.1 mg/L (95%信頼区間: 算出不可)  
最大無作用濃度 NOECr (24-48) : 10.5 mg/L  
50%生長阻害濃度 ErC50 (24-72) : 33.3 mg/L (95%信頼区間: 算出不可)  
最大無作用濃度 NOECr (24-72) : 22.9 mg/L

1,3-ビス (アミノメチル) ベンゼン (CAS.1477-55-0)

① 生長曲線



② 阻害率曲線



Dose-response curve for EC50 of Algae Growth Test (Logit method)  
1477550

③ 毒性値

0-72hErC50 (実測値に基づく) = 28 mg/L  
0-72hNOECr (実測値に基づく) = 9.8 mg/L

## 要 旨

### 試験委託者

環境庁

### 表 題

1,3-ベンゼンジメタンアミンのオオミジンコ (*Daphnia magna*) に対する急性遊泳阻害試験

### 試験番号

9 B 4 7 1 G

### 試験方法

本試験は、OECD 化学品テストガイドライン No. 202 「ミジンコ類、急性遊泳阻害試験および繁殖試験」(1984年)に準拠して実施した。

- 1) 被験物質： 1,3-ベンゼンジメタンアミン
- 2) 暴露方式： 止水式，水面をテフロンシートで被覆
- 3) 供試生物： オオミジンコ (*Daphnia magna*)
- 4) 暴露期間： 48時間
- 5) 試験濃度 (設定値)： 対照区，5.00，8.90，16.0，28.0，50.0 mg/L  
公比：1.8
- 6) 試験液量： 100 mL/容器
- 7) 連数： 4 容器/濃度区
- 8) 供試生物数： 20頭/濃度区 (5頭/容器)
- 9) 試験温度： 20±1℃
- 10) 照明： 16時間明/8時間暗
- 11) 分析法： HPLC法



## 結 果

### 1) 試験液中の被験物質濃度

被験物質の測定濃度がすべて設定値の±20%以内であったため、各影響濃度の算出には設定値を採用した。

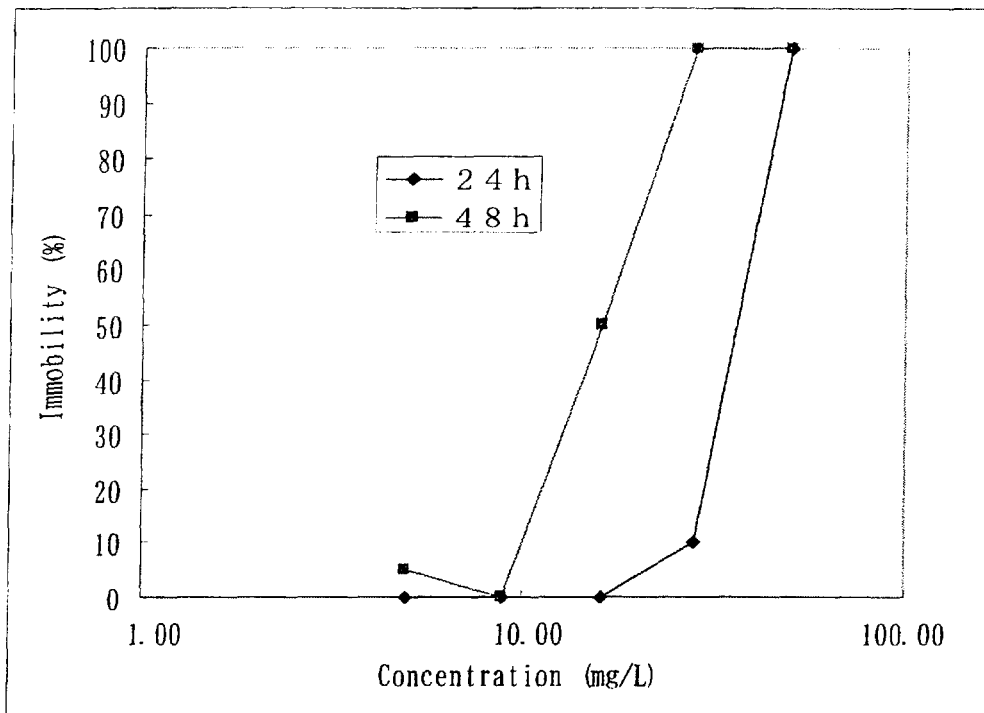
### 2) 24時間暴露後の結果

半数遊泳阻害濃度 (EiC50) : 35.1 mg/L (95%信頼限界 : 28.0~50.0 mg/L)  
最大無作用濃度 (NOECi) : 16.0 mg/L  
100%阻害最低濃度 : 50.0 mg/L

### 3) 48時間暴露後の結果

半数遊泳阻害濃度 (EiC50) : 15.2 mg/L (95%信頼限界 : 12.3~18.7 mg/L)  
最大無作用濃度 (NOECi) : 8.90 mg/L  
100%阻害最低濃度 : 28.0 mg/L

Figure 1 Concentration-Response (Immobility) Curve



## 要 旨

### 試験委託者

環境庁

### 表 題

1,3-ベンゼンジメタンアミンのオオミジンコ (*Daphnia magna*) に対する繁殖阻害試験

### 試験番号

9 B 4 9 3 G

### 試験方法

本試験は、OECD 化学品テストガイドラインNo. 211「オオミジンコ繁殖試験」(1998年)に準拠して実施した。

- 1) 被験物質： 1,3-ベンゼンジメタンアミン
- 2) 暴露方式： 半止水式 (24時間毎に試験液の全量を交換)  
水面をテフロンシートで被覆
- 3) 供試生物： オオミジンコ (*Daphnia magna*)
- 4) 暴露期間： 21日間
- 5) 試験濃度 (設定値) :  
対照区, 0.150, 0.470, 1.50, 4.70, 15.0 mg/L  
公比 : 3.2
- 6) 試験液量： 80 mL/容器
- 7) 連数： 10容器/濃度区
- 8) 供試生物数： 10頭/濃度区 (1頭/容器)
- 9) 試験温度： 20±1℃
- 10) 照明： 16時間明/8時間暗
- 11) 分析法： HPLC法

## 結 果

### 1) 試験液中の被験物質濃度

被験物質の測定濃度がすべて設定値の±20%以内であったため、各影響濃度の算出には設定値を採用した。

### 2) 21日間暴露の各影響濃度結果を以下に示す。

親ミジンコの半数致死濃度 (LC50) : 6.77 mg/L

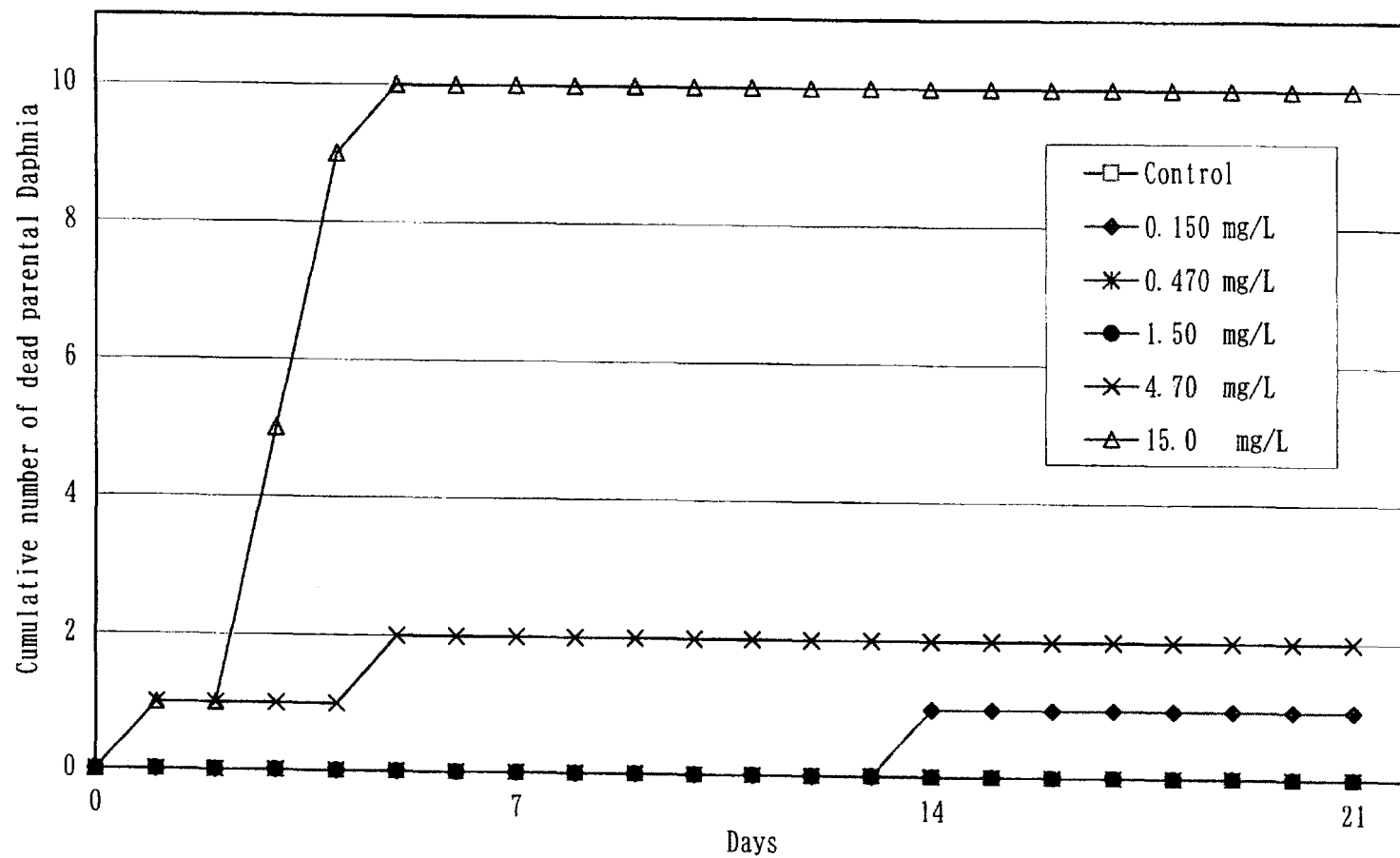
(95%信頼限界 : 1.50~15.0 mg/L)

50% 繁殖阻害濃度 (EC50) : 8.40 mg/L

(95%信頼限界 : 算出不可)

最大無作用濃度 (NOEC) : 4.70 mg/L

最小作用濃度 (LOEC) : 15.0 mg/L

Figure 1 Cumulative Numbers of Dead Parental *Daphnia*

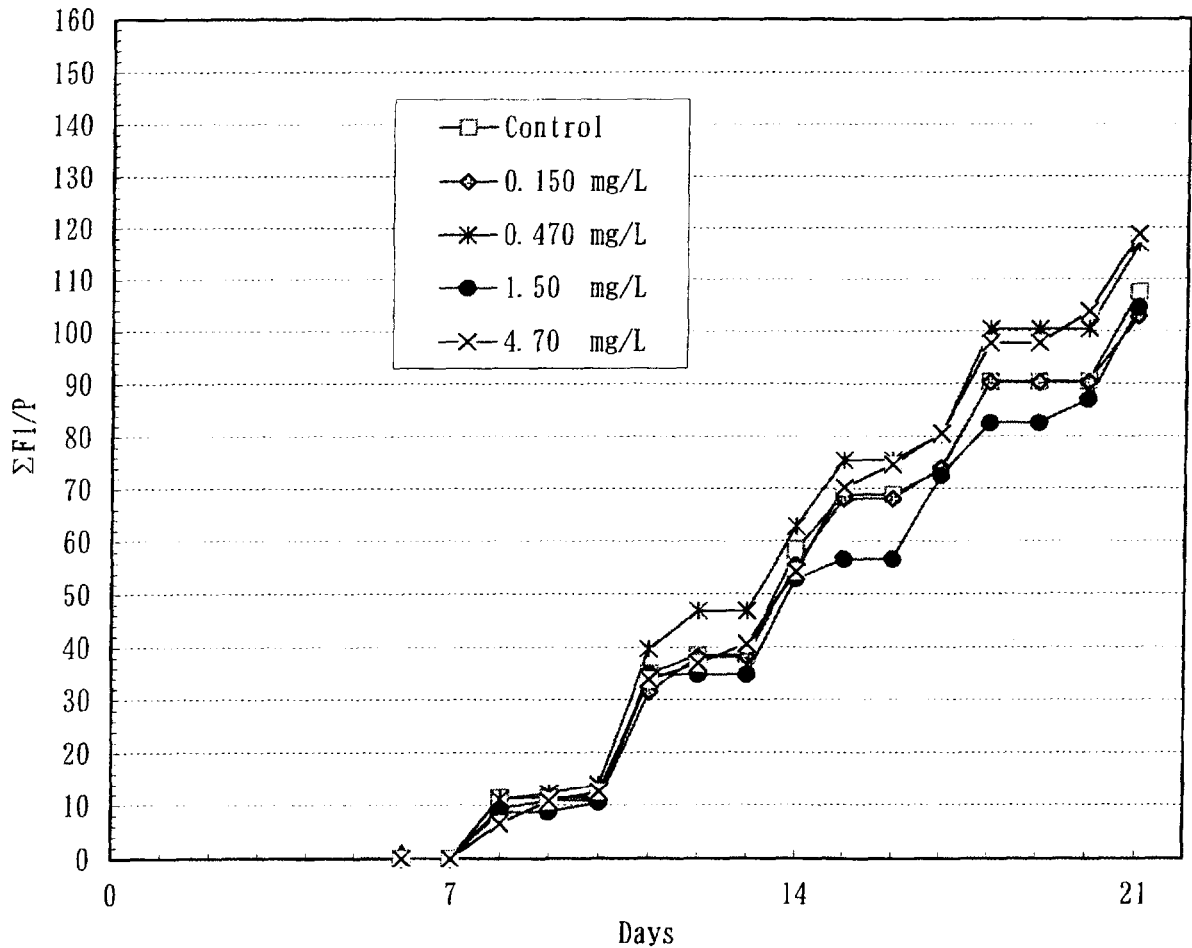
Values in legend are given in the nominal concentration.

Table 4 Mean Cumulative Numbers of Juveniles Produced per Adult Alive for 21 Days ( $\Sigma F1/P$ )

Nominal Conc.	Days															
	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Control	0.0	0.0	11.4	11.5	11.5	34.9	38.5	38.5	58.5	68.8	68.8	73.6	90.5	90.5	90.5	107.5
0.150 mg/L	0.0	0.0	9.3	10.9	10.9	31.4	38.1	38.1	55.6	68.0	68.0	74.0	90.3	90.3	90.3	102.8
0.470 mg/L	0.0	0.0	11.2	12.3	14.0	39.7	46.8	46.8	62.8	75.5	75.5	80.4	100.4	100.4	100.4	116.9
1.50 mg/L	0.0	0.0	8.6	8.7	10.5	34.7	34.7	34.7	53.0	56.8	56.8	72.5	82.6	82.6	87.0	104.5
4.70 mg/L	0.0	0.0	6.5	10.8	12.6	33.8	36.9	40.6	54.4	70.3	74.6	80.6	97.8	97.8	103.8	118.8
15.0 mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-: All parental *Daphnia* were dead during a 21-days testing period.

Figure 2 Time Course of  $\Sigma F1/P$  for Each Concentration Level



Values in legend are given in the nominal concentration.

## 要 旨

### 試験委託者

環境庁

### 表 題

1,3-ベンゼンジメタンアミンのヒメダカ (*Oryzias latipes*) に対する急性毒性試験

### 試験番号

9 B 5 1 5 G

### 試験方法

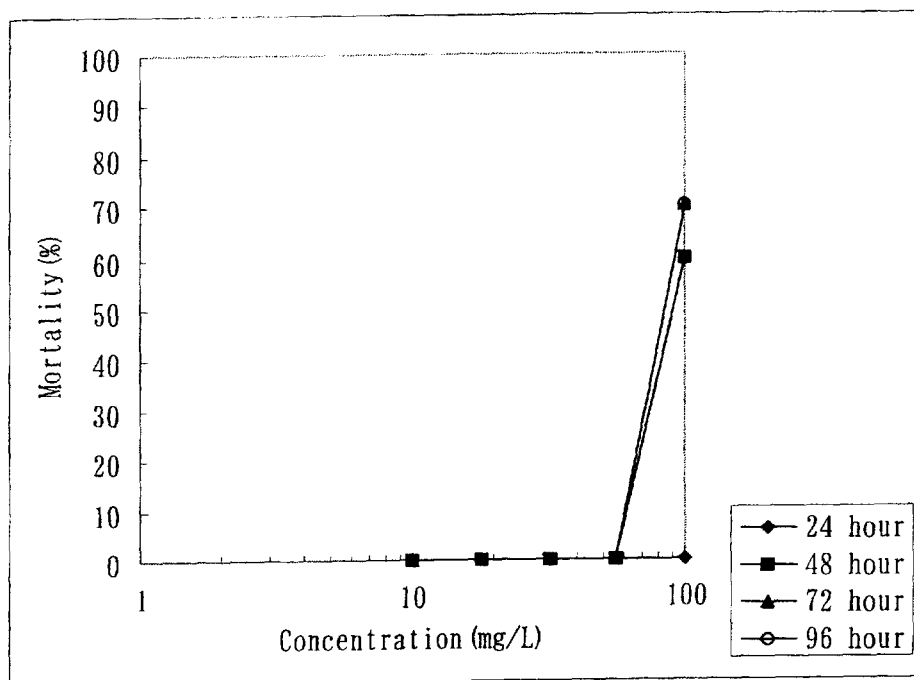
本試験は、OECD 化学品テストガイドライン No. 203 「魚類毒性試験」 (1992年) に準拠して実施した。

- 1) 被験物質： 1,3-ベンゼンジメタンアミン
- 2) 暴露方式： 半止水式 (24時間毎に試験液の全量を交換) , 水面をテフロンシートで被覆
- 3) 供試生物： ヒメダカ (*Oryzias latipes*)
- 4) 暴露期間： 96時間
- 5) 試験濃度 (設定値) : 対照区, 10.0, 18.0, 32.0, 56.0, 100mg/L  
公比 ; 1.8
- 6) 試験液量： 5.0L / 容器
- 7) 連数： 1 容器 / 濃度区
- 8) 供試生物数： 10尾 / 濃度区
- 9) 試験温度： 24±1℃
- 10) 照明： 室内光, 16時間明 / 8時間暗
- 11) 分析法： HPLC法

### 結 果

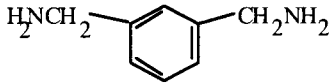
- 1) 試験液中の被験物質濃度：測定濃度はすべての濃度区において設定濃度に対して±20%以内であった。したがって、結果の算出は設定濃度に基づいて行った。
- 2) 96時間の半数致死濃度 (LC50) : 87.6 mg/L (95%信頼区間 : 56.0mg/L ~ >100mg/L)

Figure 1 Concentration-Response (Mortality) Curve





**SIDS INITIAL ASSESSMENT PROFILE**

<b>CAS No.</b>	1477-55-0
<b>Chemical Name</b>	1,3-bis(aminomethyl)benzene
<b>Structural Formula</b>	
<b>RECOMMENDATIONS</b>	
The chemical is currently of low priority for further work.	
<b>SUMMARY CONCLUSIONS OF THE SIAR</b>	
<b>Human Health</b>	
<p>There is no information on toxicokinetics. The toxicity of this chemical is entirely consistent with its corrosiveness at the site of first contact.</p> <p>Oral LD<sub>50</sub> of rats was 1090 mg/kg for males and 980 mg/kg for females [OECD TG 401]. The oral LD<sub>50</sub> of mice was 1180 mg/kg [OECD TG 401]. The inhalation LC<sub>50</sub> (4h) of rats was 0.8 mg/L for females but it was presumed to be more than 1.42 mg/L for males. The toxicity via oral administration and inhalation was tissue damage in the digestive and respiratory organs, respectively, which are the first contact sites. The chemical is corrosive to rat and mouse skin and a sensitiser in the guinea pig maximisation test.</p> <p>In the 28-day repeated dose toxicity study [OECD TG 407], the chemical was given to rats by gavage at doses of 0, 10, 40, 150 and 600 mg/kg b.w/day. One male and four females died, and salivation, low locomotor activity and piloerection were noted in the 600 mg/kg group. Furthermore, ulceration, acanthosis with hyperkeratosis and submucosal inflammation were observed in the forestomach. No adverse effects were observed in the 150 mg/kg and the lower dose groups.</p> <p>A reproductive /developmental toxicity screening test [OECD TG 421] of rats by gavage at 50, 150 and 450 mg/kg b.w/day for at least 41 days resulted in death in one male in the 150 mg/kg group, and three males and one female in the 450 mg/kg group. In almost all 450 mg/kg animals, the same histopathological changes as the above 28-day study were observed in the forestomach. No adverse effects were found at 50 mg/kg b.w/day.</p> <p>Based on this information, the NOAEL for repeated dose toxicity is considered to be 50 mg/kg b.w/day.</p> <p>In the above reproductive/developmental toxicity screening test [OECD TG 421] the substance was administered from 14 days before mating to 20 days after mating in males and to day 3 of lactation in females. No adverse effects were observed in terms of copulation, fertility, delivery and nursing of parents, and the viability, body weight and morphology of offsprings. The NOAEL for reproductive/developmental toxicity (F1 offspring) was 450 mg/kg b.w/day.</p> <p>The chemical was not mutagenic in bacteria [OECD TG 471 &amp; 472]. It induced neither chromosomal aberrations in mammalian cells <i>in vitro</i> [OECD TG 473] nor micronuclei in mouse bone marrow <i>in vivo</i> [OECD TG 474].</p> <p>In clinical observation of workers during the manufacturing process, the chemical appears to act as a gastrointestinal irritant. It has also been shown to cause contact sensitisation reactions in workers at concentrations equal to and below 0.1 mg/m<sup>3</sup> (the occupational threshold limit value in the US).</p>	

**Environment**

The chemical has a log Pow value of 0.18 at 25 °C, a vapour pressure of 0.04 hPa at 25 °C, and a water solubility of > 100 000 mg/L. Fugacity model Mackay level III calculations suggest that the majority of the chemical would distribute to soil if released to soil and/or air compartment(s), and water if released to aquatic compartment.

The chemical is not readily biodegradable (49% after 28 d) or inherently biodegradable (BOD = 22%, TOC = 6% and analysis in HPLC = 21%) and it does not hydrolyse (half-life >1 y at 25 °C). However, the chemical does not bioaccumulate (BCF < 2.7 at 0.2 mg/L). The chemical will react with carbon dioxide to form the carbamate acid, and will undergo indirect photo-oxidation with hydroxy radicals ( $T_{1/2}$  5.39 h), and will therefore not persist in the atmosphere.

Acute toxicity data were available for three kinds of fish (Medaka, 96hLC<sub>50</sub> = 87.6 mg/L; Golden orfe, 96hLC<sub>50</sub> = 75 mg/L and Rainbow trout, 96hLC<sub>50</sub> >100 mg/L). In *Daphnia magna*, acute toxicity values of 48hEC<sub>50</sub> = 15.2 mg/L and 48hEC<sub>50</sub> = 16 mg/L were reported. The chronic toxicity data for *Daphnia magna* were 6.77 mg/L EC<sub>50</sub> (21d, reproduction inhibition) and 4.7 mg/L NOEC (21d, reproduction inhibition). The parental toxicity for *Daphnia magna* was 8.4 mg/L 21dLC<sub>50</sub>. The results in algae were E<sub>50</sub>C<sub>50</sub> = 12 mg/L and NOEC = 6.25 mg/L (*Scenedesmus subspicatus*) and E<sub>50</sub>C<sub>50</sub> = 20.3 mg/L and NOEC (0 to 72 h) = 10.5 mg/L (*Selenastrum capricornutum*).

The predicted no effect concentration (PNEC) of 0.047 mg/L is estimated from the lowest chronic value (NOEC of 4.7mg/L, *D. magna* reproduction), by applying an assessment factor of 100 because two chronic studies are available (that is, in algae and daphnia).

**Exposure**

Production of the chemical in Japan is ca. 13 000 t/y (1999 – 2000). The chemical is an intermediate in the production of epoxy curing agents, polyamides and polyurethanes. Due to the chemical binding processes that occur during curing, finished products do not contain the chemical. The substance is also not present in the industrial intermediates used in the production of polyamides and polyurethanes, but a few percent is present in the epoxy curing agent. The great majority of the epoxy curing agent is assumed to be used by industrial or professional users. Greater than 99.9% of the substance is used in three categories: polyamide (major), epoxy curing agent, and polyurethane production.

Based on the chemical nature, physico-chemical properties and the annual production amount, a Mackay level III fugacity model calculation shows that the chemical would distribute mainly into water. However, the use as an intermediate indicates that most of the chemical will be consumed in the reaction process. Environmental exposure from manufacture is considered to be negligible, because aqueous waste from plant cleaning is sent to a waste-water treatment plant before release and exhaust gases are sent for incineration.

The manufacture of epoxy resins and other compounds are conducted in closed systems. Occupational exposure limit values are set world-wide as 0.1 mg/m<sup>3</sup> 15 min STEL. In a model workshop system, MXDA airborne concentrations varied from 0.064 to 0.229 mg/m<sup>3</sup> without ventilation and 0.018 to 0.051 mg/m<sup>3</sup> with ventilation. The EASE model gave a dermal exposure (non-dispersive use, indirect handling) of much less than 0.1 mg/cm<sup>2</sup>/day. Personal protective equipment (vapour masks, goggles, overalls, gloves) is worn during operations such as drum filling. For inhalation exposure, the expected human exposure (inhalation) would be EHEinh = 0.0073 mg/kg/day on the highest vapour concentration of 0.051 mg/m<sup>3</sup> in the model workshop system. If absorption occurred through hands and forearms, the calculated EHEder would be 0.03 mg/kg/day.

**NATURE OF FURTHER WORK RECOMMENDED**

The substance is not a priority for further work in relation to the use of the substance as an intermediate in a closed system.

## 4. HAZARDS TO THE ENVIRONMENT

### 4.1 AQUATIC EFFECTS

In the following table the results from acute and chronic tests with aquatic organisms are presented.

Table 5. Acute and chronic studies in aquatic organisms

Organism	Test duration	Result (mg/L)	Reference
fish			
Medaka ( <i>Oryzias latipes</i> )	96 hours (ss)	LC <sub>50</sub> (96 h) = 87.6 mg/L	(20)
Golden Orfe	96 hours (ss)	LC <sub>50</sub> (96 h) = 75 mg/L	(20)
Rainbow trout	96 hours (s)	LC <sub>50</sub> (96 h) > 100 mg/L	(20)
Invertebrates	48 hours (s)	EC <sub>50</sub> (immobilisation) = 15.2 mg/L	(21)
Water Flea	48 hours (s)	EC <sub>50</sub> (immobilisation) = 16 mg/L	(21)
( <i>Daphnia magna</i> )	21 days (ss)	EC <sub>50</sub> (reproduction) = 6.77 mg/L LC <sub>50</sub> (parent) = 8.4 mg/L NOEC (reproduction) = 4.7 mg/L	(22)
Green algae			
<i>Selenastrum capricornutum</i>	72 hours (s)	E <sub>b</sub> C <sub>50</sub> (biomass, 0 to 72 h) = 20.3 mg/L NOEC <sub>b</sub> (0 to 72 h) = 10.5 mg/L E <sub>r</sub> C <sub>50</sub> (growth rate, 24 to 72 h) = 33.3 mg/L NOEC <sub>r</sub> (24 to 72 h) = 22.9 mg/L	(23)
<i>Scenedesmus subspicatus</i>	72 hours (s)	E <sub>b</sub> C <sub>50</sub> (biomass, 72 h) = 12 mg/L E <sub>r</sub> C <sub>50</sub> (growth rate, 0 to 24 h) = 14 mg/L NOEC <sub>b</sub> (0 to 72 h) = 6.25 mg/L	(23)

(s): Static conditions

(ss): Semi-static conditions

#### 4.1.1 TERRESTRIAL EFFECTS

There is no available information.

#### 4.3 OTHER ENVIRONMENTAL EFFECTS

There is no available information.

#### 4.4 INITIAL ASSESSMENT FOR THE ENVIRONMENT

The chemical is not readily biodegradable (49%, OECD 301B) or inherently biodegradable (MITI II, corresponding to OECD 302C: BOD = 22%, TOC = 6% and analysis in HPLC = 21%). It does not bioaccumulate (BCF < 0.3 and < 2.7 at 2 and 0.2 mg/L, respectively).

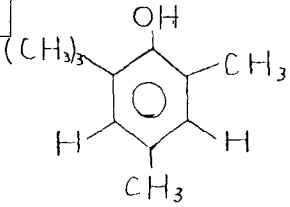
Acute toxicity data were available for three kinds of fish (Medaka, 96hLC<sub>50</sub> = 87.6 mg/L; Golden orfe, 96hLC<sub>50</sub> = 75 mg/L and Rainbow trout, 96hLC<sub>50</sub> >100 mg/L). In *Daphnia magna*, acute toxicity values of 48hEC<sub>50</sub> = 15.2 mg/L and 48hEC<sub>50</sub> = 16 mg/L were reported. The chronic

- (16) MHW, Japan(1996), Ministry of Health and Welfare, Toxicity Testing Reports of Environmental Chemicals, Vol.3 (399-401).
- (17) Enninga IC, (1989) Evaluation of the ability of Metaxylenediamine to induce chromosome aberrations in cultured Chinese Hamster Ovary (CHO) cells (including multiple fixation times), RCC Notox B.V. Report No. 017324
- (18) Enninga IC, (1990) Micronucleus test in bone marrow cells of the mouse with metaxylenediamine, RCC Notox B.V. Report No. 017313
- (19) MXDA: a skin corrosive test of metaxylene diamine founded on the Standards of the United Nations. Niigata Laboratories, Mitsubishi Gas Chemical Company (1986) (unpublished).
- (20) MOE, Japan (2000) Ministry of Environment : unpublished report of Acute toxicity study to Medaka (*Oryzias latipes*) on 1,3-benzenedimethanamine P. Wetton, Meta-Xylenediamine: acute toxicity to Golden Orfe (*Leuciscus Idus*), SafePharm Laboratories, UK, report No: 930/018 (1988) (unpublished). P Wetton, Acute toxicity to Rainbow Trout, SafePharm Laboratories, UK, report 930/003 (1995) (unpublished).
- (21) MOE, Japan (2000) Ministry of Environment : unpublished report of Acute immobilisation test to *Daphnia magna* on 1,3-benzenedimethanamine. Wetton P, Acute toxicity to *Daphnia Magna*, SafePharm Laboratories, report 930/002 (1995) (unpublished).
- (22) MOE, Japan (2000) Ministry of Environment : unpublished report of A reproduction-inhibition study to *Daphnia magna* on 1,3-benzenedimethanamine.
- (23) MOE, Japan (2000) Ministry of Environment : unpublished report of A growth-inhibition study to algae (*Selenastrum capricornutum*) on 1,3-benzenedimethanamine. C Mead, Algal inhibition test, SafePharm Laboratories, report 930/001 (1995) (unpublished).



藻類生長阻害試験

1. 供試物質の概要

名称	日本名	6-tert-ブチル-2,4-キシレノール	
	英名	6-tert-Butyl-2,4-xyleneol	
	一般名・商品名		
構造式		分子式・示性式	$(\text{CH}_3)_3\text{CC}_6\text{H}_2(\text{CH}_3)_2\text{OH}$
		分子量	178.27
		水への溶解度	不溶
		蒸気圧	
入手先	東京化成工業株式会社	製造年月日	年 月 日
	TEL 03 (324) 0573	ロット番号	FAW01
純度	99.9%	不純物:	
その他の物性等	凝固点が22~23℃, 密度0.961 (20℃), 引火点111℃		

2. 供試藻類の概要

種名及び株番号	Selenastrum capricornutum ATCC 22662
由来	配布・市販・機関育種 入手先名称: 国立環境研究所 TEL 0298 (51) 6111
培養方法	規定の方法・その他( ) *その他の場合、培養方法を添付すること。

3. 試験条件

試験温度	23 ± 1 °C	
培地	規定の培地・その他( ) *その他の場合、培地組成を添付すること。	
培養装置	メーカー名: 恒温室を使用	型式:
細胞密度計数方法	計数方法	電子粒子計数装置・計算盤と顕微鏡・蛍光光度計・分光光度計・比色計
	測定装置	メーカー名: 日立

試験溶液	状態	無色透明
	保管方法	冷蔵庫(冷暗所)・常温(明・暗所)・その他( )
	調製方法	希釈水に直接溶解・溶解補助剤を使用・その他( ) 助剤名：DMSO 助剤添加方法：被験物質を助剤に溶かして使用
光源	蛍光灯・その他( ) 照度：4,000 lux 光量： $0.72 \times 10^{20}$ photons/m <sup>2</sup> S	

#### 4. 試験結果

- (1) 藻類生長阻害試験結果 (→様式1-1~1-5)
- (2) 各濃度区及び対照区の生長曲線のグラフ (→図1-1)
- (3) 供試物質の濃度と細胞密度の関係を示すグラフ (→図1-2,1-3)

#### 5. その他、特記事項

(様式1-1) 藻類生長阻害試験結果 (予備試験)

供試物質名 : 6-tert-ブチル-2,4-キシレノール  
 試験実施期間 : 平成4年12月16日 ~ 平成4年12月19日 (4日間)  
 試験機関名 : 仙台市衛生研究所  
 濃度公比 : 10

区分	物質濃度 mg/L	助剤濃度 mg/L	細胞密度及びpH						観察事項 pH変動の理由
			0hr	pH	24hr	48hr	72hr	pH	
対照	0	11		7.3	75759	198369	1322070	8.7	
助剤対照	0	11		7.5	71589	167380	914991	8.6	
1	0.01	11		7.4	71589	172186	1024702	8.5	
2	0.1	11		7.2	69591	141232	729550	8.6	
3	1	11		7.2	65760	95016	241847	8.3	
4	10	11		7.1	60405	67648	71589	7.9	
5	100	11		7.4	58719	58719	58719	7.9	

\* 供試物質濃度を測定した場合、その値を ( ) の中に入れて物質濃度欄に記入すること。

藻類の生長に対する影響が観察されなかった濃度	0.01 mg/L
対照と比べ50%以上の生長阻害が観察された濃度	1 mg/L

【本試験の設定濃度及び設定根拠】

公比	設定濃度区 (mg/L)					設定根拠
	1	2	3	4	5	
1.8	1.0	1.7	3.1	5.6	10.0	予備試験の結果より



## (様式1-2) 藻類生長阻害試験結果 (本試験①)

供試物質名 : 6-tert-ブチル-2,4-キシレンール  
 試験実施期間: 平成5年1月13日 ~ 平成5年1月15日 (4日間)  
 試験機関名 : 仙台市衛生研究所  
 濃度公比 : 1.8

区分	物質濃度 mg/L	助剤濃度 mg/L	連番	細胞密度及び pH					観察事項 pH変動の理由	
				0hr	pH	24hr	48hr	72hr		pH
対照	0	12.3	1		7.4	75759	153751	772050	9.3	
			2		7.4	65760	109465	414143	9.1	
			3		7.4	71589	182217	1566845	9.6	
			平均		7.4	71036	148478	917679	9.3	
助剤 対照	0	12.3	1		7.9	69591	145287	490819	9.0	
			2		7.9	69591	153751	941265	9.2	
			3		7.9	69591	129732	477119	8.6	
			平均		7.9	69591	142923	636401	8.9	
1	1.0	12.3	1		7.7	71589	141232	339691	8.9	
			2		7.7	71589	115842	438269	8.9	
			3		7.7	67648	119168	504913	8.7	
			平均		7.7	70275	125414	427624	8.8	
2	1.7	12.3	1		7.7	71589	115842	359480	8.7	
			2		7.7	65760	100552	359480	8.7	
			3		7.7	67648	126110	450854	8.9	
			平均		7.7	68332	114168	389938	8.8	
3	3.1	12.3	1		7.8	65760	89786	248792	8.4	
			2		7.8	65760	92364	215954	8.2	
			3		7.8	67648	109465	294854	8.4	
			平均		7.8	66389	97205	253200	8.3	
4	5.6	12.3	1		7.7	62140	75759	137289	8.0	
			2		7.7	63924	82475	129732	8.1	
			3		7.7	63924	80173	133457	8.1	
			平均		7.7	63329	79469	133493	8.1	
5	10.0	12.3	1		7.6	63924	73645	89786	7.9	
			2		7.6	63924	71589	89786	7.9	
			3		7.6	62140	73645	92364	7.8	
			平均		7.6	63329	72960	90645	7.9	

\* 供試物質濃度を測定した場合、その値を ( ) の中に入れて物質濃度欄に記入すること。

## (様式1-3) 藻類生長阻害試験結果 (本試験②)

供試物質名 : 6-tert-ブチル-2,4-キシレノール  
 試験機関名 : 仙台市衛生研究所

区分	濃度 mg/L	連番	面積 A(0-72hr)	阻害率 I <sub>a</sub> (%)	比生長速度 μ(24-48hr)	低下率 I <sub>m</sub> (%)	比生長速度 μ(24~72hr)	低下率 I <sub>m</sub> (%)
対照	0	1	14172840		0.0295		0.0484	
		2	8575116		0.0212		0.0383	
	12.3	3	24293484		0.0389		0.0643	
		平均	15680480		0.0299		0.0503	
助剤 対照	0	1	10446900		0.0307		0.0407	
		2	16055388		0.0330		0.0543	
	12.3	3	9909180		0.0260		0.0401	
		平均	12137156		0.0299		0.0450	
1	1.0	1	8583996		0.0283		0.0324	
		2	9157572		0.0201		0.0377	
	12.3	3	9942540		0.0236		0.0419	
		平均	9228036	24.0	0.0240	19.5	0.0374	18.4
2	1.7	1	8212104		0.0201		0.0336	
		2	7705248		0.0177		0.0354	
	12.3	3	9460440		0.0260		0.0395	
		平均	8459264	30.3	0.0212	28.7	0.0362	21.3
3	3.1	1	6118608		0.0130		0.0277	
		2	5786424		0.0142		0.0248	
	12.3	3	7188960		0.0201		0.0307	
		平均	6364664	47.6	0.0157	47.0	0.0277	39.5
4	5.6	1	4357044		0.0083		0.0165	
		2	4470360		0.0106		0.0147	
	12.3	3	4459812		0.0094		0.0153	
		平均	4429072	63.5	0.0094	68.5	0.0155	66.3
5	10.0	1	3779088		0.0059		0.0071	
		2	3729744		0.0047		0.0071	
	12.3	3	3767208		0.0071		0.0083	
		平均	3758680	69.0	0.0059	80.3	0.0075	83.8

\* 「濃度」の欄は上段に供試物質濃度を下段に助剤濃度を記入すること。