[SIDS data] Oral toxicity study was performed in SD (Crj: CD) rats by an OECD combined repeated dose and reproductive/developmental toxicity screening test. Isocyanuric acid was administered by gavage at doses of 10, 40, 150 and 600 mg/kg/day for 45 days in males and from 14 days before mating to day 3 of lactation in females. (MHW, Japan: 1997)

The parental animals exhibited no alteration in reproductive parameters including the copulation index, fertility index, gestation length, numbers of corpora lutea or implantation, implantation index, gestation index, delivery index, and behavior at delivery and lactation. There were no significant differences in offspring parameters including number of offspring or live offspring, the sex ratio, live birth index, viability index and body weight. No external or visceral abnormalities related to the test substance were detected in any of the offspring. Therefore, NOAEL for parents and offsprings was considered to be 600 mg/kg/day.

Three-generation study was conducted. Sodium isocyanurate was given by drinking water at concentrations of 400, 1,200 and 5,375 ppm to CD rats. Treatment was initiated at 36 days of age and continued for a minimum of 100 days before mating. Weanlings from the F1 and F2 litters were randomly selected as the next parents and continued on treatment for the additional 120 days. Selected litters and F3 offsprings were sacrificed 4 weeks after weaning, and organ weight measurements and microscopic examination of tissues were carried out. (Wheeler *et al.*: 1985)

No compound-related changes were observed in mortality, body weights, food consumption, gestation length, litter size, pup survival to weaning, sex ratio, and pup weight. In pathological and histological findings, epithelial hyperplasia with chronic cystitis was observed only in a few of high-dose treated males in F2 offsprings, which were attributed to chronic irritation by the calculi in the urinary bladder. However, this change is considered not to be due to reproductive toxicity of this chemical. In other treated groups, there were no changes. Therefore, NOAEL for reproductive toxicity was considered to be 5,375 ppm (approx. 370 mg/kg/day for male and 630 mg/kg/day for female).

Male CD-1 mice were treated intraperitoneally at doses of sodium isocyanurate (125 and 250 mg/kg/day). As positive control, methyl methane sulfonate was used at dose of 50 mg/kg/day. Males were mated with non-treated females. Although early resorptions were observed in females mated with males treated with methyl methane sulfonate, any chemical-related effects were not observed in females, mated with sodium isocyanurate treated males. Therefore, NOAEL was considered to be 250 mg/kg/day. (FMC Corporation: 1972)

Developmental toxicity

[SIDS data] Pregnant Dutch belted rabbits were given sodium isocyanurate at doses of 50, 200 and 500 mg/kg/day by gavage during days 6-18 of gestation. (FMC Corporation, unpublished observations)

Although slight decrease in body weight was observed in mid- and high-dose dams during the treatment period, compensatory weight gains occurred after termination of treatment on day 18. There were no compound related mortality or other adverse reactions in all treated dams. The mean number of live fetus/dam and sex ratio was essentially comparable for all groups. Fetal body weights and crown/rump lengths were reduced slightly in high-dose groups, compared to control. These changes may have resulted from the slight manifestations of maternal toxicity that occurred during treatment. There was no evidence of external or internal malformations or skeletal anomalies. Therefore, NOAEL for developmental toxicity was considered to be 200 mg/kg/day.

Sodium isocyanurate was administered at doses of 200, 1,000, and 5,000 mg/kg/day by oral gavage to pregnant CD rats during days 6-15 of gestation. Sodium control groups received sodium hippurate at dose of 1,118 and 5,590 mg/kg/day. (Industry ad hoc Committee for Isocyanurates: 1982)

There was no mortality in all treated groups. Although decrease in body weight and crown/rum length, increase in post-implantation loss, incidence incomplete ossification were observed in sodium control group, no treatment related effect on maternal appearance, behaviour and body weight gain, and no teratogenic effect were observed in all groups treated with sodium isocyanurate. Therefore, NOAEL for developmental toxicity was considered to be 5,000 mg/kg/day.

f) Genetic toxicity

Bacterial test
[SIDS data] Isocyanuric acid was not mutagenic to *S. typhimurium* TA1535, TA1537, TA98, TA100 with or without metabolic activation (Hayworth *et al.*: 1983).

Isocyanuric acid did not induce the bacteriophage Lambda in *Escherichia coli* K12 en VA UVRB (NORSOLOR/APC: 1977).

Non-bacterial test *in vitro*
[SIDS data] In chromosomal aberration test *in vitro*, clastogenicity or polyploidy in CHL/IU cells was not induced in the absence or presence of an exogenous metabolic activation system (MHW, Japan: 1997).

In lymphoma assay, this chemical also showed negative result at up to a concentration of 2000 μg/ml in the TK locus of L5178Y mouse lymphoma cells (Industry ad hoc Committee for Isocyanurates: 1981a). This chemical did not induce sister chromatid exchange in CHO cells (Industry ad hoc committee for Isocyanurates: 1981b), and this negative result was confirmed on human lymphoid cell line (LAZ-007) by Sobti *et al.* (1981), although the concentration was very low (2μg/ml).

in vivo Test
[SIDS data] In chromosomal aberration test *in vivo*, rats were killed 24 and 48 hr after administration of sodium isocyanurate by gavage at single dosages up to 5000 mg/kg, and bone marrow cells were collected and examined. As a result, this chemical did not induce chromosomal aberrations in rat bone marrow cells (Hammond *et al*: 1985).

g) Carcinogenicity

CD rats were administered sodium isocyanurate in drinking water at concentrations of 400, 1,200, 2,400 or 5,375 ppm for 2 years. Estimated daily doses were indicated only for 2,400 and 5,375 ppm (male: 154 and 371 mg/kg/day, female: 266 and 634 mg/kg/day, respectively). For a second control, sodium hippurate was administered as the same amount of sodium as the highest dose. Treatment-related mortality was observed in some males of the highest dose group, which died during the first 12 months of the study. This mortality was due to the development of calculi in the urinary tract. In some males that died on test and in some that were sacrificed at 12 months, there were pathologic changes, including hyperplasia, bleeding, and inflamed ureters, and renal tubular nephrosis. Although slight tubular nephrosis was also observed in a few females of the highest dose group during the first 12 months, these animals did not exhibit bladder calculi. Inflammatory

lesions in the heart were also apparent in some of the highest dose males that died early. There was no evidence of a test article related carcinogenic effect. (Cascieri *et al.*: 1985)

B6C3F1 mice were administered sodium isocyanurate in drinking water at concentrations of 100, 400, 1,200 and 5,375 ppm for 2 years. Apparently swollen enlarged abdomen was observed at the highest dose groups, related to increase in water consumption. There were no effects on survival, clinical pathology (except for urinary sodium), organ weight, gross and histopathology. There was no evidence of a test article related carcinogenesis. (Industry Ad hoc Committee for Isocyanurates: 1986)

h) Toxicodynamics/toxicokinetics

Toxicokinetics study of sodium isocyanurate was performed in rats and dogs, using [^{14}C] sodium isocyanurate. Administration was performed at 5 mg/kg by oral or intravenous route and at 500 mg/kg by oral route. At 5 mg/kg, this chemical was completely absorbed and largely eliminated in urine, while at 500 mg/kg, this chemical was incompletely absorbed and largely eliminated in feces. The elimination half-life was 30 to 60 min in rats and 1.5 to 2 hr in dogs after oral or intravenous administration. In dogs, sodium isocyanurate distributed into an apparent volume of distribution of 0.7 L/kg, which is somewhat greater than total body water volume. Rats and dogs were also administered unlabeled sodium isocyanurate orally at 5 mg/kg/day followed by the single exposure of 5 mg/kg radiolabeled sodium isocyanurate on day 15. In rats, the remainder of radioactivity in most tissues was below the level of detection 7 days after treatment for repeated dose administration and for all sampling times for both single and repeated dose administration in dogs. As results of repeated dose study, it was shown that isocyanurate did not bioaccumulate in tissues. There was no evidence that isocyanurate was biodegraded, as only unchanged isocyanurate was found in excreta. (Barbee *et al.*: 1983)

Toxicokinetics study by dermal route was performed, in which species was not indicated. After dermal application, the ^{14}C-labelled substance is not detectable in the blood and < 0.01 % of the administered dose is found in the urine. This result showed that isocyanuric acid was absorbed only in very small quantities. (Toxikologische Bewertung: 1993)

i) Experience with human exposure

Toxicokinetics of isocyanuric acid was investigated in 5 volunteers, who soaked in a swimming pool for 120 minutes. As a result, the cumulative excretion of isocyanuric acid was 0.03-2.8 mg, equivalent to 3.0-3.6 ml of pool water and the elimination half-life is calculated as 3 hr. On the other hand, recovery of ingested isocyanuric acid was 98 % in urine. There was no correlation between toxicokinetics and gamma glutamyl transpeptidase activity. (Allen *et al.*: 1982)

4.3 Initial Assessment for Human Health

Isocyanuric acid is lowly toxic in acute toxicity studies. This chemical is considered to be slightly irritating to eyes, but not to the skin. Several subchronic oral toxicity studies demonstrated renal damages, such as dilatation of the renal tubules, necrosis or hyperplasia of the tubular epithelium, increased basophilic tubules, neutrophilic infiltration, mineralization and fibrosis. These changes were probably caused by crystal of this chemical in renal tubules. The mechanism of this renal toxicity is supported by the toxicokinetics studies in animals and humans, showing that this chemical is quickly absorbed and excreted to urine within a few hours as an unchanged form. NOAEL is considered to be 150 mg/kg/day. In a developmental toxicity study, reduction of fetal body weights and crown/rump lengths was observed and NOAEL was 200 mg/kg/day, but this most

likely reflects toxicty to the dams. No reproductive toxicity was observed (NOAEL: 600 mg/kg/day). A variety of *in vitro* and *in vivo* genotoxicity studies show this chemical is not genotoxic. Two years studies of rats and mice indicate this chemical has no carcinogenic potential.

Occupational exposure

Isocyanuric acid is used in a closed system at industries and workers wear protective gloves and respiratory protective equipment during the operation. Although the occupational exposure route is expected as an inhalation in limited workers, there is no available data of the atmosphere concentration. Based on the predicted high concentration and the possibility of exposure period, the daily intake is calculated as 0.23 mg/kg/day as the worst case. Occupational risk is presumably low because the margin of safety is 652.

Consumer exposure

Isocyanuric acid is used in the form of chlorides in sterilizing water tank, swimming pool, bathing water, and kitchen. In Japan, trichloroisocyanurate is mainly used in swimming pool and the average concentration of isocyanuric acid is estimated as 50 to 100 μg/ml. The exposure of high performance athletes in training is expected through a swallow and skin absorption. The combined daily intake is calculated as 0.34 mg/kg/day as the worst case. Consumer risk is presumably low because the margin of safety is 441.

Indirect exposure via environment

As for indirect exposure via environment, PEC_{local} of 0.186 mg/l from local exposure scenario was used for the estimation. The daily intakes through drinking water and fish were calculated as 6.20×10^{-3} mg/kg/day and 1.40×10^{-4} mg/kg/day, respectively. Since the margin of safety is very large, such as 2.42×10^{4} for drinking water and 1.08×10^{6} for fish, health risk via environment is presumably low.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Isocyanuric acid is not readily biodegradable (OECD 301C: 0 % after 14-d) and stable in water. Bioaccumulation factor of this chemical is low (BCF < 0.5, Carp). PEC/PNEC ratio (0.186/0.32 = 0.58) is less than 1 based on the local exposure scenario in the Sponsor country. It is currently considered of low potential risk to environments and low priority for further work. However, relatively high PEC/PNEC value suggests necessity for assessment of this chemical to the river ecosystem contaminated with this chemical.

Isocyanuric acid is moderately toxic in a repeated dose study (i.e. kidney) but not toxic in reproductive toxicity study. In a developmental toxicity study, this chemical is toxic to dams, which resulted in slight fetal toxicity (reduction of body weights and crown/rump lengths). This chemical is neither genotoxic nor carcinogenic but slightly irritating to eyes. Occupational and consumer risks are expected to be low because the margin of safety is 652 and 441, respectively. As the margin of safety via indirect exposure is more than 10,000, it is currently considered of low potential human risk and low priority for further work.

5.2 Recommendations

Environment: Relatively high PEC (0.18 mg/l) and PEC/PNEC ratio (0.58) in the river receiving the effluents from the production site.

Human health: No recommendation

6. REFERENCES

- Allen, M.L. *et al.*, *Drug Metab.Rev.*, 13, 499 (1982)
- Babayan, A.A. and Aleksandryan, A.V., *Zh.Eksp.Klin.Med.*, 25(4), 345 (1985)
- Barbee, S.J. *et al.*, *Toxicologist*, 3, 80 (1983)
- Cascieri, T. *et al.*, *Toxicologist*, 5, 58 (1985)
- D'Auria, F.D. *et al.*, *Ann.Ig.*, 1, 1445-1458 (1989)
- Datta, P.R., *Hazard Evaluation Division Report prepared for Special Pesticide Review Division*, p1 (1979)
- FMC Corporation, Industrial Bio Test, Report E 756 (1972)
- Gigiena i Sanitariya. For English translation, see HYSAAV. (V/O Mezhdunarodnaya Kniga, 113095 Moscow, USSR) 27(12), 13 (1962)
- Golaszewski, G. and Seux, R., *Water Res.*, 28, 207 (1994)
- Hammond, B.G. *et al.*, *Environ.Health Perspect.*,69, 287 (1986)
- Hammond, B.G. *et al.*, *Fundam.Appl.Toxicol.*, 5(4), 655 (1985)
- Hayworth, S. *et al.*, *Environmental Mutagenesis*, 5(1), 3 (1983)
- Hazleton, U.S. (Vienna), Thirteen week toxicity study in mice - Sodium monocyanurate, Report 2169-100 (1982)
- Hodge, H.C. *et al.*, *Toxicol.Appl.Pharmacol.*, 7, 667 (1965)
- Industry Ad hoc Committee for Isocyanurates, Hazleton laboratories, Report 2169-100 (1986)
- Indutry ad hoc Committee for Isocyanurates, Research Institute Int., Project 013-312-582-7 (1981a)
- Industry ad hoc committee for Isocyanurates, SRI International, Project LSC 2923, Task 1 (1981b)
- *Journal of Pharmacology and Experimental Therapeutics*, 103, 420 (1951)
- Marhold, J.V., Institut Pro Vychovu Vedoucicn Pracovniku Chemickeho Prumyclu Praha, Czechoslovakia, 152 (1972)
- Ministry of Health and Welfare: Japan, *Toxicity Testing Reports of Environmental Chemicals* 5, 429-442 (1997)
- Moody, R.P., *J. Toxicol., Cutaneous Ocul. Toxicol.*, 12, 197 (1993)
- NORSOLOR/APC, Inductest performed by Institut Pasteur de Paris (M. Hofnung), Contract 133 (1977)
- Sobti,R.C. *et al.*, Cytogenetic monitoring of environmental pollutants in South Florida, AACR Abstracts, 435 (1981)
- Toxicity Information (Monsanto Industrial Chemicals Co., Bancroft Bldg., Suite 204, 3411 Silverside Rd., Wilmington, DE 19810) (1972)
- Toxikologische Bewertung. Heidelberg, Berufsgenossenschaft der chemischen Industrie, 103, 28 p (1993)
- Wheeler, A.G. *et al.*, *Toxicologist*, 5, 189 (1985)

Appendix 1

Method for Prediction of Environmental Concentration of Pollutant in Surface Water

1. Predicted environmental concentration in the local environment (PEC_{local}) with effluent release into river

When decomposition, precipitation and vaporization of pollutant can be ignored, it is used that simplified equation by complete mixing model shown with equation (1) to calculate predicted environmental concentration in the local environment (PEC_{local}) as for release effluent into river.

$$PEC_{local}\ (mg/L) = \frac{Co\ Q + Cs\ Qs}{Q + Qs} \qquad (1)$$

Where

Co: Concentration of pollutant in upper stream of release point (mg/L)
Cs: Concentration of pollutant in effluent (mg/L)
Q: Flow rate of river (m^3/day)
Qs: Flow rate of effluent released into river (m^3/ day)

At the equation (1), when Co can be considered as 0, dilution factor of pollutant in the river (R) can be shown with following equation.

$$R = Cs/C = (Q + Qs) / Qs \qquad (2)$$

As the worst case, it is used to employ a flow rate at dry season as flow rate of river (Q). When flow rate at dry season is indistinct, it is estimated using the following equation in Japan.

$$\text{Flow rate at dry season} = \text{mean flow late} / 2.5 \qquad (3)$$

2. Predicted environmental concentration in the local environment (PEC_{local}) with effluent release into sea

For prediction of concentration of pollutant in the sea water with effluent, it is employed generally Joseph-Sendnersymbol 146 ¥f "Times New Roman" ¥s 11'}s equation (4). This equation is one of analytic solution led under the following conditions from diffusion equation.

1 It is adopted large area of sea or lake.
2 The flow rate of effluent and concentration of pollutant in the effluent are constant, and distribution of concentration is able to regard as equilibrium state.
3 Effluent is distributed uniformly to vertical direction, and it spreads in a semicircle or segment to horizontal direction.
4 Diffusion coefficient of pollutant at the sea is in proportion to distance from release point of effluent.
5 There is not any effect of tidal current.
6 Decomposition of pollutant can be ignored.

$$C(x) = (C_s - C(r))\left(1 - \exp\left(-\frac{Q_s}{d\,p}\left(\frac{1}{x} - \frac{1}{r}\right)\right)\right) + C(r) \quad (4)$$

Where

C (x): Concentration of pollutant at distance x (m) from release point
Cs: Concentration of pollutant in effluent
C (r): Concentration of pollutant at distance r (m) from release point
Qs: Flow rate of effluent (m^3/day)
: Opening angle of seacoast (rad.)
d: Thickness of diffusion layer (m)
P: Diffusion velocity (m/day) (1.0 0.5 cm/sec)

When C(x) is 0 at r = and density stratification is ignored for simplification, Joseph-Sendnersymbol 146 ¥f "Times New Roman" ¥s 11'}s equation (4) is simplified to equation (5)

$$C(x) = C_s\left(1 - \exp\left(-\frac{Q_s}{d\,p\,x}\right)\right) \quad (5)$$

Because of Qs/ d p x << 1 except vicinity of release point, dilution factor in distance x from release point R(x) can be shown with equation (6).

$$R(x) = C_s/C(x) = d\,p\,x/Q_s \quad (6)$$

When it is employed following parameters in equation (6) as default, dilution factor R can be shown with equation (7).

P = 1 cm/sec (860 m/day)
= 3.14
d = 10 m
x = 1000 m

$$R = 2.7\ 10^7/Q_s \quad (7)$$

Qs: volume of effluent (m^3/day)

REVISED OECD HPV FORM 1

SIDS DOSSIER ON THE HPV PHASE 5 CHEMICAL

Isocyanuric acid

CAS No. 108-80-5

Sponsor Country: Japan

DATE: March 15, 1999

CONTENTS

B. Ph Value, Pka Value
2.7 Flash Point (Liquids)
2.8 Auto Flammability (Solid/Gases)
2.9 Flammability
2.10 Explosive Properties
2.11 Oxidising Properties
2.12 † Oxidation: Reduction Potential
2.13 Additional Remarks
A. Partition Co-Efficient Between Soil/Sediment And Water (Kd)
B. Other Remarks

3. Environmental Fate And Pathways

3.1 Stability
3.1.1 * Photodegradation
3.1.2 * Stability In Water
3.1.3 Stability In Soil
3.2 * Monitoring Data (Environment)
3.3 * Transport And Distribution Between Environmental Compartments Including Estimated Environmental Concentrations And Distribution Pathways
3.3.1 Transport
3.3.2 Theoretical Distribution (Fugacity Calculation)
3.4 Mode Of Degradation In Actual Use
3.5 * Biodegradation
3.6 Bod-5, Cod Or Ratio Bod-5/Cod
3.7 Bioaccumulation
3.8 Additional Remarks
A. Sewage Treatment
B. Other

4. Ecotoxicity

4.1 * Acute/Prolonged Toxicity To Fish
4.2 Acute Toxicity To Aquatic Invertebrates
* A. Daphnia
B. Other Aquatic Organisms
4.3 * Toxicity To Aquatic Plants E.G., Algae
4.4 Toxicity To Bacteria
4.5 Chronic Toxicity To Aquatic Organisms
4.5.1 Chronic Toxicity To Fish
4.5.2 (*) Chronic Toxicity To Aquatic Invertebrates (E.G., Daphnia Reproduction)
4.6 Toxicity To Terrestrial Organisms
4.6.1 Toxicity To Soil Dwelling Organisms
4.6.2 Toxicity To Terrestrial Plants
4.6.3 Toxicity To Other Non-Mammalian Terrestrial Species (Including Birds)
4.7 Biological Effects Monitoring (Including Biomagnification)
4.8 Biotransformation And Kinetics
4.9 Additional Remarks

5. Toxicity

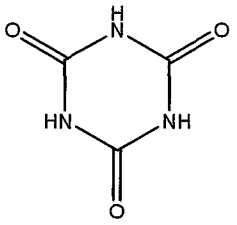
5.1 * Acute Toxicity
5.1.1 Acute Oral Toxicity
5.1.2 Acute Inhalation Toxicity
5.1.3 Acute Dermal Toxicity
5.1.4 Acute Toxicity By Other Routes Of Administration
5.2 Corrosiveness/Irritation
5.2.1 Skin Irritation/Corrosion
5.2.2 Eye Irritation/Corrosion
5.3 Skin Sensitisation
5.4 * Repeated Dose Toxicity
5.5 * Genetic Toxicity In Vitro
A. Bacterial Test
B. Non-Bacterial In Vitro Test
5.6 * Genetic Toxicity In Vivo
5.7 Carcinogenicity
5.8 * Toxicity To Reproduction
5.9 * Developmental Toxicity / Teratogenicity
5.10 Other Relevant Information
A. Specific Toxicities (Neurotoxicity, Immunotoxicity Etc.)
B. Toxicodynamics, Toxicokinetics
5.11 * Experience With Human Exposure

6. References

Appendix-1

Note: *; Data Elements In The Sids
†; Data Elements Specially Required For Inorganic Chemicals

SIDS PROFILE

1.01 A.	**CAS No.**	108-80-5
1.01 C.	**CHEMICAL NAME (OECD Name)**	Isocyanuric acid
1.01 D.	**CAS DESCRIPTOR**	
1.01 G.	**STRUCTURAL FORMULA**	
	OTHER CHEMICAL IDENTITY INFORMATION	
1.5	**QUANTITY**	20,000 tonnes/year in Japan
1.7	**USE PATTERN**	Intermediate in closed system.
1.9	**SOURCES AND LEVELS OF EXPOSURE**	407.7 tonnes/year Release into river
ISSUES FOR DISCUSSION (IDENTIFY, IF ANY)	SIDS testing required: Water solubility, Vapour pressure, Octanol/water partition coefficient, Stability in water, Biodegradation, Chronic toxicity to daphnia, Combined repeat dose and reproductive toxicity, Chromosomal aberration test in vitro	

SIDS SUMMARY

CAS NO: 108-80-5		Information	OECD Study	GLP	Other Study	Estimation Method	Acceptable	SIDS Testing Required
STUDY		**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**
PHYSICAL-CHEMICAL DATA								
2.1	Melting Point	Y	N	N	Y	N	Y	N
2.2	Boiling Point	Y	N	N	Y	N	Y	N
2.3	Density	N						N
2.4	Vapour Pressure	N						Y
2.5	Partition Coefficient	N						Y
2.6	Water Solubility	N						Y
	pH and pKa values	N						N
2.12	Oxidation: Reduction potential	N						N
OTHER P/C STUDIES RECEIVED								
ENVIRONMENTAL FATE and PATHWAY								
3.1.1	Photodegradation	N						N
3.1.2	Stability in water	N						Y
3.2	Monitoring data	N						N
3.3	Transport and Distribution	N						N
3.5	Biodegradation	N						Y
OTHER ENV FATE STUDIES RECEIVED								
ECOTOXICITY								
4.1	Acute toxicity to Fish	Y	N	N	Y	N	N	Y
4.2	Acute toxicity to Daphnia	Y	N	N	Y	N	N	Y
4.3	Toxicity to Algae	N						Y
4.5.2	Chronic toxicity to Daphnia	N						Y
4.6.1	Toxicity to Soil dwelling organisms	N						N
4.6.2	Toxicity to Terrestrial plants	N						N
4.6.3	Toxicity to Birds	N						N
OTHER ECOTOXICITY STUDIES RECEIVED								
TOXICITY								
5.1.1	Acute Oral	Y	N	N	Y	N	Y	N
5.1.2	Acute Inhalation	Y	N	N	Y	N	Y	N
5.1.3	Acute Dermal	Y	N	N	Y	N	Y	N
5.4	Repeated Dose	Y	N	Y	Y	N	Y	Y
5.5	Genetic Toxicity *in vitro*							
	. Gene mutation	Y	N	N	Y	N	Y	N
	. Chromosomal aberration	N						Y
5.6	Genetic Toxicity *in vivo*	Y	N	N	Y	N	Y	N
5.8	Reproduction Toxicity	Y	N	Y	Y	N	Y	Y
5.9	Development / Teratogenicity	Y	N	Y	Y	N	Y	N
5.11	Human experience	Y	N	N	Y	N	Y	N
OTHER TOXICITY STUDIES RECEIVED		Y	N	N	Y	N	Y	N

1. GENERAL INFORMATION

1.01 SUBSTANCE INFORMATION

***A. CAS number** 108-80-5

B. Name *(IUPAC name)*

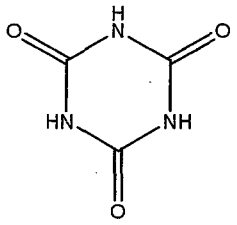
***C. Name** *(OECD name)* Isocyanuric acid

†D. CAS Descriptor

E. EINECS-Number 203-618-0

F. Molecular Formula $C_3H_3N_3O_3$

***G. Structural Formula**



H. Substance Group

I. Substance Remark

J. Molecular Weight 129.08

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)
Environmental Agency (EA)
Ministry of Labour (MOL)

Contact person: Mr. Kazuhide Ishikawa
Second International Organization Division
Economic International 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

Same as above contact person

1.1 GENERAL SUBSTANCE INFORMATION

A. Type of Substance

element [ ]; inorganic[ ]; natural substanc [ ]; organic[**X**]; organometallic [ ]; petroleum product [ ]

B. Physical State *(at 20°C and 1.013 hPa)*

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

C. Purity 99.7 %

1.2 SYNONYMS

sym-Triazine-2,4,6-triol; sym-Triazinetriol; normal Cyanuric acid; 2,4,6-Trihydroxy-1,3,5-triazine; Trihydroxycyanidine; Tricyanic acid; Pseudocyanuric acid; 1,3,5-Triazine-2,4,6(1H,3H,5H)-trione; 1,3,5-Triazine-2,4,6-triol; 1,3,5-Triazinetriol; 1,3,5-Triazinetrione; Tricarbimide; Trihydroxy-1,3,5-triazine

1.3 IMPURITIES

None

1.4 ADDITIVES

None

*1.5 QUANTITY

Remarks: 20,000 tonnes/year
Reference: MITI, Japan

1.6 LABELLING AND CLASSIFICATION

None

*1.7 USE PATTERN

A. General

Type of Use:	**Category:**
main	Intermediate
industrial	Intermediate in closed system
use	Intermediate for various chemicals

Remarks: None
Reference: MITI, Japan

1.8 OCCUPATIONAL EXPOSURE LIMIT

None

* 1.9 SOURCES OF EXPOSURE

In Japan, isocyanuric acid is produced in 2 companies.

Source:	Media of release:	River
	Quantities per media:	407.7 tonnes/year
Remarks:		
Reference:	MITI, Japan	

2. PHYSICAL-CHEMICAL DATA

*2.1 MELTING POINT

Value:	330 °C
Decomposition:	Yes [X] No [ ] Ambiguous [ ]
Sublimation:	Yes [ ] No [X] Ambiguous [ ]
Method:	
GLP:	Yes [ ] No [X] ? [ ]
Remarks:	
Reference:	Organic Chemical Dictionary

*2.2 BOILING POINT

Value:	not measurable
Pressure:	
Decomposition:	Yes [ ] No [X] Ambiguous [ ]
Method:	
GLP:	Yes [ ] No [X] ? [ ]
Remarks:	
Reference:	MITI, Japan

*2.4 VAPOUR PRESSURE

Value:	$< 5.0 \times 10^{-3}$ Pa
Temperature:	25 °C
Method:	calculated [ ]; measured [X] OECD TG 104
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	purity: 99.9 %
Remarks:	
Reference:	MITI, Japan

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

Log Pow:	< 0.3
Temperature:	25 °C

Method:	calculated [ ]; measured [X] OECD TG 107 HPLC method
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	purity: 99.9 %
Remarks:	
Reference:	MITI, Japan

***2.6 WATER SOLUBILITY**

A. Solubility

Value:	2.7 g/l
Temperature:	25 °C
Description:	Miscible [ ]; Of very high solubility [X]; Soluble [ ]; Slightly soluble [ ]; Of low solubility [ ]; Of very low solubility [ ]; Not soluble [ ]
Method:	OECD TG 105
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	purity: 99.9 %
Remarks:	
Reference:	MITI, Japan

B. pH Value, pKa Value

Value:	$pK_1 = 6.88$ $pK_2 = 11.40$ $pK_3 = 13.50$
Reference:	Merck Index

3. ENVIRONMENTAL FATE AND PATHWAYS

3.1 STABILITY

***3.1.2 STABILITY IN WATER**

Type:	Abiotic (hydrolysis) [X]; biotic (sediment)[ ]
Half life:	Stable in pH 4, 7, 9 at 25 °C
Method:	OECD TG 111
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	purity: 99.9 %
Remarks:	
Reference:	MITI, Japan

***3.2 MONITORING DATA (ENVIRONMENTAL)**

(a)

Type of Measurement:	Background [ ]; At contaminated site [ ]; Other [X]
Media:	Surface water (lake)
Results:	ND (Detection limits: 0.002 mg/l) in 3 areas in Japan as of 1983

Remarks: ND: Not detected
Reference: Chemicals in the environment, EA, Japan (1984)

(b)
Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]
Media: Surface water (estuary)
Results: ND (Detection limits: 0.004 mg/l) in 1 area in Japan as of 1983
Remarks: ND: Not detected
Reference: Chemicals in the environment, EA, Japan (1984)

(c)
Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]
Media: Surface water (sea)
Results: ND (Detection limits: 0.002 - 0.004 mg/l) in 6 areas in Japan as of 1983
Remarks: ND: Not detected
Reference: Chemicals in the environment, EA, Japan (1984)

(d)
Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]
Media: Sediment (lake)
Results: ND (Detection limits: 0.12 - 0.24 mg/kg-dry) in 3 areas in Japan as of 1983
Remarks: ND: Not detected
Reference: Chemicals in the environment, EA, Japan (1984)

(e)
Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]
Media: Sediment (estuary)
Results: ND (Detection limit: 0.09 mg/kg-dry) in 1 area in Japan as of 1983
Remarks: ND: Not detected
Reference: Chemicals in the environment, EA, Japan (1984)

(f)
Type of Measurement: Background [ ]; At contaminated site [ ]; Other [X]
Media: Sediment (sea)
Results: ND (Detection limit: 0.025 - 0.15 mg/kg-dry) in 6 areas in Japan as of 1983
Remarks: ND: Not detected
Reference: Chemicals in the environment, EA, Japan (1984)

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

*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	0.1 %	0.0 %	0.0 %
Water	46.5 %	99.6 %	40.5 %
Soil	53.3 %	0.0 %	59.3 %
Sediment	0.2 %	0.4 %	0.2 %

Remarks: Appendix 1
Reference: MITI. Japan

*3.5 BIODEGRADATION

Type: aerobic **[X]**; anaerobic [ ]
Inoculum: adapted [ ]; non-adapted **[X]**;
Concentration of the chemical: related to COD [ ]; DOC [ ]; test substance **[X]**
Medium: water **[X]**; water-sediment [ ]; soil [ ]; sewage treatment [ ]
Degradation: 0 % by BOD after 14 days
7.8 % by TOC after 14 days
5.3 % by HPLC after 14 days
Results: readily biodeg. [ ]; inherently biodeg. [ ]; under test condition no biodegradation observed **[X]**, other [ ]
Method: OECD TG 301C
GLP: Yes **[X]** No [ ] ? [ ]
Test substance: purity: 99.9 %
Reference: MITI, Japan

3.7 BIOACCUMULATION

Species: Carp (*Cyprinus carpio*)
Exposure period: 6 weeks
Temperature: 25 °C
Concentration: (1) 10 mg/L
(2) 1 mg/L
BCF: (1) < 0.1
(2) < 0.5
Method: OECD TG 305C
Type of test: calculated [ ]; measured **[X]**
static[ ]; semi-static[ ]; flow-through**[X]**; other*(e.g. field test)*[ ]
GLP: Yes **[X]** No [ ] ? [ ]
Test substance: purity: 99.9 %
Remarks:
Reference: MITI, Japan

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_{50} (96h) > 100 mg/l
Analytical monitoring:	Yes [X] No [ ] ? [ ]
Method:	OECD TG 203 (1992)
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	As prescribed by 1.1 - 1.4, purity: 99.7 %
Remarks:	Groups of 10 Himedaka were exposed to the nominal concentrations of 6.25, 12.5, 25, 50 and 100 mg/l and laboratory water control. Solubilizer was not used. Concentrations of the test substance were kept close to the nominal concentrations (99.5 to 103 %).
Reference:	Environment Agency of Japan (1996)

(b)

Type of test:	static [ ]; semi-static[ ]; flow-through [X]; other *(e.g. field test)* [ ] open-system [X]; closed-system [ ]
Species:	*Oryzias latipes* (Himedaka)
Exposure period:	14 d
Results:	LC_{50} (14d) > 100 mg/l
Analytical monitoring:	Yes [X] No [ ] ? [ ]
Method:	OECD TG 203 (1992)
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	As prescribed by 1.1 - 1.4, purity: 99.7 %
Remarks:	Groups of 10 Himedaka were exposed to the nominal concentrations of 10, 32 and 100 mg/l and laboratory water control. Solubilizer was not used. Concentrations of the test substance were kept close to the nominal concentrations throughout the 14-d test (99 to 102 %).
Reference:	Environment Agency of Japan (1996)

4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

*A. Daphnia

Type of test:	static [X]; semi-static [ ]; flow-through [ ]; other*(e.g. field test)*[ ]; open-system [X]; closed-system [ ]
Species:	*Daphnia magna.*
Exposure period:	48 h
Results:	EC_{50} (48h) = 1000 mg/l
Analytical monitoring:	Yes [X] No [ ] ? [ ]
Method:	OECD TG 202
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	As prescribed by 1.1 - 1.4, purity: 99.7 %

Remarks:	20 daphnids (4 replicates; 5 organisms per replicate) were exposed to measured concentrations of 100, 180, 320, 580 and 1000 mg/l and laboratory water control. Solubilizer was not used. Concentrations of the test substance were kept close to the nominal concentrations throughout the 48-h test (99.2 to 103.0 %).
Reference:	Environment Agency of Japan (1996)

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

Species:	*Selenastrum capricornutum* ATCC 22662
Endpoint:	Biomass [X]; Growth rate [ ]; Other [ ]
Exposure period:	72 h
Results:	Biomass $EC_{50\ (72h)}$ = 620 mg/l *(Endpoint)* NOEC = 62.5 mg/l
Analytical monitoring:	Yes [X] No [ ] ? [ ]
Method:	OECD TG 201 (1984) open-system [ ]; closed-system [X]
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	As prescribed by 1.1 - 1.4, purity: 99.7 %
Remarks:	Static test. The EC_{50} value for biomass was calculated based on the measured concentrations of the nominal concentrations 62.5, 125, 250, 500 and 1000 mg/l. No solubilizer was used. Concentrations of the test substance were kept close to the nominal concentrations throughout the 72-h test (98 to 105 %).
Reference:	Environment Agency of Japan (1996)

4.4 TOXICITY TO BACTERIA

No data

4.5 CHRONIC TOXICITY TO AQUATIC ORGANISMS

4.5.1 CHRONIC TOXICITY TO FISH

(*)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: $EC_{50\ (21\ d)}$ = 65.9 mg/l *(Endpoint)* NOEC = 32.0 mg/l
Analytical monitoring:	Yes [X] No [ ] ? [ ]
Method:	OECD TG 202(1984)
GLP:	Yes [X] No [ ] ? [ ]
Test substance:	As prescribed by 1.1 - 1.4, purity: 99.7 %
Remarks:	40 daphnids (4 replicate; 10 daphnids per replicate) were exposed to the nominal concentrations of 1.0, 3.2, 10, 32 and 100 mg/l and laboratory water control (dechlorinated tap water).

Concentrations of the test substance were kept close to the nominal concentrations throughout the 21-d test (95 to 103 %). The test water was renewaled every 2 or 3 days.

Reference: Environment Agency of Japan (1996)

4.6 TOXICITY TO TERRESTRIAL ORGANISMS

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 AVIAN)

No data

4.7 BIOLOGICAL EFFECTS MONITORING (INCLUDING BIOMAGNIFICATION)

No data

4.8 BIOTRANSFORMATION AND KINETICS

No data

4.9 ADDITIONAL REMARKS

None

5. TOXICITY

*5.1 ACUTE TOXICITY

5.1.1 ACUTE ORAL TOXICITY

(a)	Type:	LD_0 [ ]; LD_{100} [ ]; LD_{50} [X]; LDL_0 [ ]; Other [ ]
	Species/strain:	Rats/albino
	Value:	7,700 mg/kg b.w.
	Method:	Other
	GLP:	Yes [ ] No [X] ? [ ]
	Test substance:	purity: unknown
	Remarks:	
	Reference:	Babayan & Aleksandryan: 1985
(b)	Type:	LD_0 [ ]; LD_{100} [ ]; LD_{50} [X]; LDL_0 [ ]; Other [ ]
	Species/strain:	Rats
	Value:	> 7,500 mg/kg b.w.

Method: Other
GLP: Yes [ ] No [X] ? [ ]
Test substance: Sodium isocyanurate, purity: unknown
Remarks:
Reference: *Gigiena i Sanitariya*: 1962

(c) Type: LD_0 [ ]; LD_{100} [ ]; LD_{50} [X]; LDL_0 [ ]; Other [ ]
Species/strain: Mice
Value: 3,400 mg/kg b.w.
Method: Other
GLP: Yes [ ] No [X] ? [ ]
Test substance: purity: unknown
Remarks:
Reference: Babayan & Aleksandryan: 1985

(d) Type: LD_0 [ ]; LD_{100} [ ]; LD_{50} [ ]; LDL_0 [X]; Other [ ]
Species/strain: Rabbits
Value: > 10 g/kg b.w.
Method: Other
GLP: Yes [ ] No [X] ? [ ]
Test substance: purity: unknown
Remarks:
Reference: Toxicity Information: 1972

5.1.2 ACUTE INHALATION TOXICITY

Type: LC_0 [ ]; LC_{100} [ ]; LC_{50} [ ]; LCL_0 [ ]; Other [X]
Species/strain: Rats
Exposure time: not indicated
Value: 612 mg/m^3
Method: Other
GLP: Yes [ ] No [X] ? [ ]
Test substance: As an aerosol, purity: unknown
Remarks: Minimum toxic concentration
Reference: Babayan & Aleksandryan: 1985

5.1.3 ACUTE DERMAL TOXICITY

Type: LD_0 [ ]; LD_{100} [ ]; LD_{50} [X]; LDL_0 [ ]; Other [ ]
Species/strain: Rabbits
Value: > 7,940 mg/kg b.w.
Method: Other
GLP: Yes [ ] No [X] ? [ ]
Test substance: purity: unknown
Remarks:
Reference: Toxikologische Bewertung: 1993

5.1.4 ACUTE TOXICITY, OTHER ROUTES OF ADMINISTRATION

Type: LD_0 [ ]; LD_{100} [ ]; LD_{50} [X]; LDL_0 [ ]; Other [ ]
Species/strain: Rats

Route of Administration:	i.m. [ ]; i.p. [ ]; i.v. [X]; infusion [ ]; s.c. [ ]; other [ ]
Exposure time:	
Value:	> 100 mg/kg b.w.
Method:	Other
GLP:	Yes [ ] No [X] ? [ ]
Test substance:	purity: unknown
Remarks:	
Reference:	*Gigiena i Sanitariya*: 1962

Type:	LD_0 [ ]; LD_{100} [ ]; LD_{50} [X]; LDL_0 [ ]; Other [ ]
Species/strain:	Mice
Route of Administration:	i.m. [ ]; i.p. [ ]; i.v. [X]; infusion [ ]; s.c. [ ]; other [ ]
Exposure time:	
Value:	> 500 mg/kg b.w.
Method:	Other
GLP:	Yes [ ] No [X] ? [ ]
Test substance:	purity: unknown
Remarks:	
Reference:	*Gigiena i Sanitariya*: 1962

Type:	LD_0 [ ]; LD_{100} [ ]; LD_{50} [X]; LDL_0 [ ]; Other [ ]
Species/strain:	Cats
Route of Administration:	i.m. [ ]; i.p. [ ]; i.v. [X]; infusion [ ]; s.c. [ ]; other [ ]
Exposure time:	
Value:	2,144 mg/kg b.w.
Method:	Other
GLP:	Yes [ ] No [X] ? [ ]
Test substance:	Sodium isocyanurate, purity: unknown
Remarks:	
Reference:	*J. Pharmacol. Exp. Ther.*: 1951

5.2 CORROSIVENESS/IRRITATION

5.2.1 SKIN IRRITATION/CORROSION

Species/strain:	Rabbits
Results:	Highly corrosive [ ]; Corrosive [ ]; Highly irritating [ ]; Irritating [ ]; Moderate irritating [ ]; Slightly irritating [ ]; Not irritating [X]
Classification:	Highly corrosive (causes severe burns) [ ]; Corrosive (causes burns)[ ]; Irritating [ ]; Not irritating [ ]
Method:	Federal Hazardous Substances Act (FHSA) tests
GLP:	Yes [ ] No [X] ? [ ]
Test substance:	purity: unknown
Remarks:	
Reference:	Hammond *et al.*: 1986

5.2.2 EYE IRRITATION/CORROSION

(a) Species/strain: Rabbits

	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:	Federal Hazardous Substances Act (FHSA) tests
	GLP:	Yes [ ] No [X] ? [ ]
	Test substance:	purity: unknown
	Remarks:	
	Reference:	Hammond *et al.*: 1986
(b)	Species/strain:	Rabbits
	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:	Rinsed with water
	GLP:	Yes [ ] No [X] ? [ ]
	Test substance:	purity: unknown
	Remarks:	Administration into the eye at 20 mg/24 hr
	Reference:	Toxicity Information: 1972
(c)	Species/strain:	Rabbits
	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:	Administration into the eye at 500 mg/24 hr
	Reference:	Marhold: 1972

5.3 SKIN SENSITISATION

No data

*5.4 REPEATED DOSE TOXICITY

(a)	Species/strain:	Rats/Crj: CD (SD)
	Sex:	Female [ ]; Male [ ]; Male/Female [X]; No data [ ]
	Route of Administration:	Oral (by gavage)
	Exposure period:	Male: 44 days Female: From 14 days before mating to day 3 of lactation
	Frequency of treatment:	Daily
	Post exposure observation period:	
	Dose:	0, 10, 40, 150, 600 mg/kg/day
	Control group:	Yes [X]; No [ ]; No data [ ]; Sesame oil Concurrent no treatment[ ]; Concurrent vehicle[X];Historical[ ]
	NOAEL:	150 mg/kg/day
	LOAEL:	600 mg/kg/day

	Results:	Isocyanuric acid indicated toxic effects at 600 mg/kg in both sexes. Excretion of reddish urine was evident. In addition, depression of body weight gain was observed in males. Urinalyses of males revealed appearance of crystals, which is considered this chemical precipitated from urine, and increases of erythrocytes and leukocytes. In hematological examination of males, significant decreases in erythrocyte counts, hemoglobin concentrations and hematocrit values were observed. In blood chemical examination of males, increases in urea nitrogen and creatinine, and a decrease of sodium were revealed. In histopathological examination, dilatation of the renal tubules, necrosis or hyperplasia of the tubular epithelium, increased basophilic tubules, neutrophilic infiltration, mineralization and fibrosis in the kidney, hyperplasia of the mucosal epithelium in the urinary bladder and vacuolization of the zona fasciculata in the adrenals were observed in both sexes. In addition, the incidence of atrophic thymus also showed a tendency for increase in females. Absolute and relative kidney weights and relative adrenal weights were increased in both sexes.
	Method:	OECD Combined Repeat Dose and Reproductive/ Developmental Toxicity Screening Test
	GLP:	Yes [X] No [ ] ? [ ]
	Test substance:	purity: 99.8 %
	Reference:	MHW, Japan: 1997
(b)	Species/strain:	Rats/Rochester strain (Wistar-derived)
	Sex:	Female [ ]; Male [ ]; Male/Female [X]; No data [ ]
	Route of Administration:	Oral (in diet)
	Exposure period:	20 weeks
	Frequency of treatment:	Daily
	Post exposure observation period:	
	Dose:	0, 0.8, 8 % (calculated daily dose: 0, 56, 560 mg/kg)
	Control group:	Yes [X]; No [ ]; No data [ ]; Concurrent no treatment[ ];Concurrent vehicle[X]; Historical[ ]
	NOAEL:	0.8 % (56 mg/kg/day)
	LOAEL:	8 % (560 mg/kg/day)
	Results:	14/20 males and 4/20 females died at 8 %, but no died at 0.8 %. Considerable decrease in body weight gain was observed at 8 %. Urine samples taken prior to the start of feeding and again near termination of the study showed normal concentrations of protein and sugar. In hematological examination no change was observed. There were no changes in organ weights (thyroid, liver, brain, lungs, heart, etc.), expect for kidney weight, which increased at 8 % in females. In histologic study, dilatation of distal collecting tubules and dusts of Bellini, with focal areas of epithelial proliferation were observed at 8 % in both sexes.
	Method:	Other
	GLP:	Yes [ ] No [X] ? [ ]
	Test substance:	Sodium isocyanurate, purity: unknown
	Reference:	Hodge *et al.*: 1965