Name: OECD_SIDS / SUBSTANCE : triallylamine / 102-70-5 / N,N-diallylprop-2-en-1-amine / 102-70-5 Fri, 16 Dec 2022, 15:59:22+0900 /

Legal entity owner: National Institute of Health Sciences

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Author:
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Remarks:

Dossier header

Dossier submission type

Name
OECD SIDS

Version
core 7.0

Name (given by user)

Dossier subject

Dossier subject
triallylamine / 102-70-5 / N,N-diallylprop-2-en-1-amine / 102-70-5

Public name

Submitting legal entity
National Institute of Health Science

Dossier creation date/time
Fri, 16 Dec 2022, 15:59:22+0900

Used in category

LEGAL_ENTITY: National Institute of Health Science

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Author:	
Date:	2022-11-07T16:24:02.822+09:00
Remarks:	

General information

Legal entity name
National Institute of Health Science

triallylamine / 102-70-5

General information

Identification

Identification

SUBSTANCE: triallylamine / 102-70-5

UUID:	5b2f90f6-d0e5-42af-8dde-60216f1f8213
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Author:	
Date:	2022-12-16T15:59:12.695+09:00
Remarks:	

Substance name
triallylamine / 102-70-5

Legal entity
National Institute of Health Sciences / Kawasaki / Japan

Identification of substance

Reference substance
triallylamine / N,N-diallylprop-2-en-1-amine / 102-70-5 / 203-048-2

EC number	**EC name**
203-048-2	EC Inventory
CAS number	**CAS name**
102-70-5	
IUPAC name	
N,N-diallylprop-2-en-1-amine	

Role in the supply chain

Manufacturer
false

Importer
false

Only representative
false

Downstream user
false

Toxicological information

Repeated dose toxicity

Repeated dose toxicity: oral

ENDPOINT_STUDY_RECORD: Repeated dose toxicity: oral.001

UUID:	8d160a58-87f8-4a75-8eb0-4c61b2fa1891
Dossier UUID:	
Author:	
Date:	2022-12-16T15:51:30.064+09:00
Remarks:	

Administrative data

Endpoint
short-term repeated dose toxicity: oral

Type of information
experimental study

Adequacy of study
key study

Robust study summary
false

Used for classification
false

Used for SDS
false

Reliability
1 (reliable without restriction)

Rationale for reliability incl. deficiencies
guideline study
Reliability 1

Data source

Reference

A 28-day repeat dose oral toxicity test of triallylamine in rat with a recovery period of 2 weeks / Ministry of Health, Labour and Welfare(MHLW), Japan / publication

Data access
data published

Materials and methods

Test guideline

Qualifier
according to guideline

Guideline
OECD Guideline 407 (Repeated Dose 28-Day Oral Toxicity Study in Rodents)

Deviations
no

Qualifier
according to guideline

Guideline
other: Study Methods on New Chemical Substances, etc. (Chemical Substances Control Law of Japan)

Deviations
no

GLP compliance
yes

Test material

Specific details on test material used for the study
triallylamine / 102-70-5

Test animals

Species
rat
common rodent species

Strain
other: Crl:CD(SD)

Sex
male/female

Details on test animals or test system and environmental conditions
TEST ANIMALS
- Source: Charles River Laboratories Japan, Inc. Atsugi
- Age at study initiation: 6 weeks
- Weight at study initiation: Males: 191 - 213 g; Females: 150 - 181 g
- Housing: bracket-type metallic wire-mesh cages (W 250 × D 350 × H 200 mm)
- Diet: ad libitum
- Water: ad libitum
- Acclimation period: 9 days

ENVIRONMENTAL CONDITIONS
- Temperature (°C): 20-24 (acceptable range:23±3 °C)
- Humidity (%): 39-57 (acceptable range:50±20 %)
- Air changes: 10-15 times / hr
- Photoperiod: 12 hrs dark / 12 hrs light

Administration / exposure

Route of administration
oral: gavage

Vehicle
corn oil

Details on oral exposure
PREPARATION OF DOSING SOLUTIONS: Test substance was dissolved in corn oil for injection.

Analytical verification of doses or concentrations
yes

Details on analytical verification of doses or concentrations
Test solutions were prepared at least once in 8 days and used within 7 days of preparation.
The test solutions to be used for week 1 or week 4 of administration were analyzed for concentration by GC method at Gotemba Laboratory, Bozo Research Center Inc.
The results showed that the concentrations were 99.0 to 108.5% of the nominal concentrations (acceptable range: 100 ± 10% of the nominal value), which were all within the acceptable range.

Duration of treatment / exposure
28 days

Frequency of treatment
once a day

Doses / concentrations

Dose / conc.	
0	mg/kg bw/day (actual dose received)
Dose / conc.	
6	mg/kg bw/day (actual dose received)
Dose / conc.	
25	mg/kg bw/day (actual dose received)
Dose / conc.	
100	mg/kg bw/day (actual dose received)

No. of animals per sex per dose
6 or 12/sex/dose

Control animals
yes, concurrent vehicle

Details on study design
As a result of administering triallylamine by oral gavage to groups of 5 rats per sex at 0 (corn oil), 100, 300 and 1000 mg/kg/day for 14 days, the main change observed was death in all males and females in 1000 mg/kg bw/day and in 1 male in the 300 mg/kg bw/day group.
Therefore, the high dose in this study was set at 100 mg/kg bw/day, with a middle dose of 25 mg/kg b w/day group and a low dose of 6 mg/kg bw/day, using the common ratio of approximately 4.

Examinations

Observations and examinations performed and frequency
CAGE SIDE OBSERVATIONS: Yes
Males and females: 3 times/day during the administration period (before and after dosing) , once a day during the recovery period.

DETAILED CLINICAL OBSERVATIONS:Yes
The functional observational battery testing (FOB) was performed on all animals. Among the measures in the FOB, detailed clinical observations were made before the initiation of dosing. Thereafter, detailed clinical observations were made once a week in dosing and recovery periods.
Sensory motor reflexes, forelimb and hindlimb grip strengths, and motor activity were measured on week 4 of administration period (main/recovery group animals) and week 2 of recovery period (recovery group animals).

BODY WEIGHT: Yes
All animals were weighed before administration on days 1, 4, 7, 10, 14, 17, 21, 24 and 28 of administration and on days 1, 3, 7, 10 and 14 of recovery.

FOOD CONSUMPTION AND COMPOUND INTAKE (if feeding study):yes
Food consumption of all animals was measured prior to administration on days 1, 7, 14, 21, and 28 of administration and on days 7 and 14 of recovery.

OPHTHALMOSCOPIC EXAMINATION: yes

HAEMATOLOGY:Yes
- Time schedule for collection of blood: the after completion of the administration and recovery periods
- Anaesthetic used for blood collection: ether
- Animals fasted: Yes (overnight)
- How many animals: all animals

[red blood cell count, hemoglobin, hematocrit, mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration, reticulocyte percentage, platelet count, white blood cell count, differential leukocyte counts, prothrombin time, activated partial thromboplastin time, fibrinogen]

CLINICAL CHEMISTRY: Yes
- Time schedule for collection of blood: the day after completion of the administration and recovery periods
- Anaesthetic used for blood collection: ether
- Animals fasted: Yes (overnight)
- How many animals: all animals

[ALP, total cholesterol, triglyceride, phospholipids (PL), total bilirubin (T-BIL), glucose (GLU), blood urea nitrogen (BUN), creatinine, Na, K, Cl, Ca, P, total protein, albumin, A/G ratio (A/G)]

URINALYSIS:
Yes

- Time schedule for collection of urine: on weeks 4 of the administration period and weeks 2 of the recovery period.
- Metabolism cages used for collection of urine: Yes
- Animals fasted: 4-hour urine under fasting diet ad libitum

20- hour urine under diet and water ad libitum

Statistics
As for parametric data (grip strength, locomotor activity, body weight, body weight gain, food consu mption, water intake, quantitative items of urinalysis as well as data from hematology and blood che mistry, organ weight), the values of means and standard deviations were calculated per group.
An analysis of variance was conducted by the Bartlett test (level of significance: 1%, two-tailed). Homogeneous data were analyzed by the Dunnett test while heterogeneous data were analyzed by a Dunnett-type mean rank test between the control and each dose group (levels of significance: 5 and 1 %, two-tailed).
or the recovery groups, homogeneity of variance was tested for each group by the F-test (level of significance: 5%, one-tailed). For homogeneous data, the difference in the mean values between the control and treatment groups was analyzed by Student's t-test (levels of significance: 5 and 1%, two-tailed) while heterogeneous data were analyzed by the Aspin-Welch t-test (levels of significance: 5 and 1%, two-tailed)

Results and discussion

Results of examinations

Clinical signs
effects observed, treatment-related

Description (incidence and severity)
Decreased spontaneous movement was observed in all males and all females in the 100 mg/kg bw/day group and salivation was observed in 6/12 males and 4/12 females in the 100 mg/kg bw/day group on day 1 of administration. Further, decreased spontaneous movement was observed in 7/12 males and 7/12 females in the 100 mg/kg bw/day group on day 2 of administration.

Mortality
no mortality observed

Body weight and weight changes
no effects observed

Food consumption and compound intake (if feeding study)
effects observed, treatment-related

Haematological findings
no effects observed

Organ weight findings including organ / body weight ratios
effects observed, treatment-related

Description (incidence and severity)
Administration Period:
Significantly low values were observed in males from day 4 of administration, and in females on days 4, 7, 10, 14, 17, 21 and 28 of administration in the 100 mg/kg bw/day group.
Additionally, a significantly low value of body weight gain during the administration period was observed in males and females in the 100 mg/kg bw/day group.

Recovery Period:
Significantly low values were observed throughout the recovery period in females in the 100 mg/kg bw/day group.

Gross pathological findings
effects observed, treatment-related

Description (incidence and severity)
End of Administration Period:
In the 25 mg/kg bw/day group(1/6 females), dark red focus of glandular stomach was observed.
In the 100 mg/kg bw/day group(1/6 females), white focus of liver was observed.
In the control group(1/6 males), enlargement testis was observed.
In the 25 mg/kg bw/day group(1/6 males), white focus of epididymis was observed.
End of Recovery Period:
In the control group(1/6 females) and in the 100 mg/kg bw/day group(1/6 males), dark red focus of lung was observed.
In the control group(1/6 females), dark red focus of glandular stomach was observed.

Histopathological findings: non-neoplastic
effects observed, treatment-related

Description (incidence and severity)
End of Administration Period:
In the 25 mg/kg bw/day group(3/6 males and 3/6 females), in the 100 mg/kg bw/day group(in all males and all females), hypertrophy of centrilobular hepatocytes in the liver was observed .

In the control group(2/6 males), in the 6 mg/kg bw/day group(1/6 males), in the 25 mg/kg bw/day group(4/6 males), in the 100 mg/kg bw/day group(all males), minimal eosinophilic bodies in the kidney were observed. And their incidence and severity increased in males in the 25 mg/kg bw/day and above groups.

The following findings were judged to be incidental based on the incidence of their occurrence or their histopathological profiles.
[Eye boll, Pituitary, Thyroid, Spleen, Lung (including bronchus), Stomach, Liver, Kidney, Testis, Epid idymis, Prostate, Sternum (including bone marrow), Skeletal muscle femoral]

End of Recovery Period:
In the 100 mg/kg bw/day group(1/6 males), minimal hypertrophy of centrilobular hepatocytes in the l iver was observed.

In the control group(2/6 males), in the 100 mg/kg bw/day group(4/6 males), minimal eosinophilic bodies in the kidney were observed, and their incidence increased in males in the 100 mg/kg bw/day group.

Effect levels

Key result
false

Dose descriptor
NOAEL

Effect level

6 mg/kg bw/day (actual dose received)

Based on
test mat.

Sex
male/female

Basis for effect level
gross pathology
pathological changes in the liver

Target system / organ toxicity

Key result
false

Critical effects observed
yes

Lowest effective dose / conc.

25 mg/kg bw/day (actual dose received)

System
gastrointestinal tract

Organ
liver

Treatment related
yes

Dose response relationship
yes

Any other information on results incl. tables

Figures and Tables (in English) are available in the following full report of the study.

http://dra4.nihs.go.jp/mhlw_data/home/pdf/PDF102-70-5b.pdf

Applicant's summary and conclusion

Conclusions
Based on the histopathological changes in the liver in the 25 mg/kg bw/day group, the NOAEL for repe ated-dose oftriallylamine was determined to be 6 mg/kg bw/day in rats.

Executive summary

The repeated-dose toxicity of triallylamine was evaluated in rats according to the OECD TG 407. Male and female rats (6 or 12 animals/sex/dose) were treated with triallylamine via oral gavage for 28 days at 0 (vehicle: corn oil), 6, 25, and 100 mg/kg bw/day. Six of the 12 animals/sex receiving 0 and 100 mg/kg bw/day were assigned to a 14-day recovery group prior to sacrifice.

No deaths were observed in either sex. Salivation and decreased locomotor activity were observed at the beginning of the dosing period at the highest dose in both sexes. Hind limb grip strength decreased in males treated with 100 mg/kg bw/day. Body weight and body weight gain were decreased in both sexes treated with 100 mg/kg bw/day. Food consumption was decreased in both sexes treated with ≥

25 mg/kg bw/day. Water intake was increased in males receiving 25 and 100 mg/kg bw/day. Treatment with 100 mg/kg bw/day led to increased urine volume in males and decreased osmolality in both sexes, and positive results for calcium oxalate crystals tended to increase in the urine sediment examination in both sexes. Blood chemistry analysis showed decreased triglyceride levels in males receiving 25 and 100 mg/kg bw/day, but increased levels in females receiving 100 mg/kg bw/day. The relative weight of the kidney was increased, without histopathological changes, in males receiving 100 mg/kg bw/day. In females, the relative weight of the liver was increased at 25 and 100 mg/kg bw/day, while the absolute weight of the liver was increased in both sexes treated with 100 mg/kg bw/day. Histopathological examination of the liver showed centrilobular hepatocellular hypertrophy in both sexes receiving ≥ 25 mg/kg bw/day. Changes due to triallylamine treatment observed during or at the end of the 14-day recovery period recovered, with some exceptions. Body weight remained decreased during the recovery period in females treated with 100 mg/kg bw/day, and centrilobular hepatocellular hypertrophy was observed in males treated with 100 mg/kg bw/day. Based on the histopathological changes in the liver in the 25 mg/kg bw/day group, the NOAEL for repeated-dose of triallylamine was determined to be 6 mg/kg bw/day in rats.

ENDPOINT_STUDY_RECORD: Repeated dose toxicity: oral.002

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Dossier UUID:	
Author:	
Date:	2022-12-16T15:54:11.334+09:00
Remarks:	

Administrative data

Endpoint
repeated dose toxicity: oral, other A reproduction/developmental toxicity screening test in rats treated orally of triallylamine

Type of information
experimental study

Adequacy of study
key study

Robust study summary
false

Used for classification
false

Used for SDS
false

Reliability
1 (reliable without restriction)

Rationale for reliability incl. deficiencies
guideline study
Reliability 1

Cross-reference

Reason / purpose for cross-reference
reference to same study

Related information
OECD / Toxicity to reproduction / Toxicity to reproduction.001 / triallylamine / 102-70-5 / N,N-diallylprop-2-en-1-amine / 102-70-5

Remarks
Toxicity to reproduction.001

Data source

Reference

A reproduction/developmental toxicity screening test in rats treated orally of triallylamine / Ministry of Health, Labour and Welfare (MHLW), Japan / publication

Materials and methods

Test guideline

Qualifier
according to guideline

Guideline
other: Guideline for reproduction/developmental toxicity screening test in rats (Chemical Substa nces Control Law of Japan)

GLP compliance
yes

Test material

Specific details on test material used for the study
triallylamine / 102-70-5

Test animals

Species
rat
common rodent species

Strain
other: Crl:CD(SD)

Details on test animals or test system and environmental conditions
TEST ANIMALS
- Source: Charles River Laboratories Japan, Inc. Atsugi
- Age at study initiation: 10 weeks
- Weight at study initiation: Males: 402 - 455 g; Females: 239 - 283 g
- Housing: bracket-type metallic wire-mesh cages (W 254 × D 350 × H 170 mm)
- Diet: ad libitum
- Water: ad libitum
- Acclimation period: 20 days

ENVIRONMENTAL CONDITIONS
- Temperature (°C): 23-24 (acceptable range:23±3 °C)
- Humidity (%): 42-53 (acceptable range:50±20 %)
- Air changes: 12-17 times / hr
- Photoperiod: 12 hrs dark / 12 hrs light

Administration / exposure

Route of administration
oral: gavage

Vehicle
corn oil

Details on oral exposure
PREPARATION OF DOSING SOLUTIONS: Test substance was dissolved in corn oil for injection.

Vehicle
- Name: Corn oil
- Lot Number: WEK6144, PDQ0071
- Manufacturer: Wako pure Chemical Industries, Ltd.

- Storage Conditions: Room temperature

Analytical verification of doses or concentrations
yes

Details on analytical verification of doses or concentrations
Test solutions were prepared at least once in 8 days and used within 7 days of preparation.
The test solutions to be used for week 1 or week 6 of administration were analyzed for concentration by GC method at Gotemba Laboratory, Bozo Research Center Inc.
The results showed that the concentrations were 98.3 to 102.0% of the nominal concentrations (acceptable range: 100 ± 10% of the nominal value), which were all within the acceptable range.

Duration of treatment / exposure
Males were dosed for 30 days, including a 14-day pre-mating period and subsequent mating period.
Females were dosed for 40–47 days, including 14-day pre-mating, mating, and gestation periods, and until lactation day 3.

Frequency of treatment
once a day

Doses / concentrations

Dose / conc.	
0	mg/kg bw/day (actual dose received)
Dose / conc.	
6	mg/kg bw/day (actual dose received)
Dose / conc.	
25	mg/kg bw/day (actual dose received)
Dose / conc.	
100	mg/kg bw/day (actual dose received)

No. of animals per sex per dose
12 animals/sex/dose

Control animals
yes, concurrent vehicle

Details on study design
The dose levels of this study were selected based on the results of the previously conducted study, “A 28-day repeat dose oral toxicity test of triallylamine in rat with a recovery period of 2 weeks ”.

In that study, there was decreased body weight gain at 100 mg/kg bw/day, but no effects were found for reproduction organs.
Based on these results, the high dose in this reproduction/developmental toxicity screening test was s et at 100 mg/kg bw/day, and the lower doses were set at 6 mg/kg bw/day.

- Rationale for animal assignment (if not random): Body weight-balanced randomization

Examinations

Observations and examinations performed and frequency
CAGE SIDE OBSERVATIONS: Yes
Males and females: 3 times/day during the administration period (before and after dosing)

DETAILED CLINICAL OBSERVATIONS: Yes

BODY WEIGHT: Yes
male: on days 1, 8, 15, 22 of administration, and the day of necropsy.
female: on days 1, 8, 15 before mating , gestation days 0, 7, 14, 20, lactation days 0, 4, and the day of necropsy.

FOOD CONSUMPTION AND COMPOUND INTAKE (if feeding study):yes
male: on days2, 8, 15 of administration
female: on days 2, 8, 15 before mating; gestation days 1, 7, 14, 20; lactation days 2, 4, and the day of necropsy.

OPHTHALMOSCOPIC EXAMINATION: yes
Males and females: 3 times/day

HAEMATOLOGY: no
CLINICAL CHEMISTRY: no
URINALYSIS: no

Statistics
The data were analyzed for homogeneity of variance by the Bartlett test. If variances were homogeneous, data was analyzed by the Dunnett test, whereas heterogeneous data was analyzed by the Steel test ($p<0.05$, two-sided).
2 groups: The data were analyzed for homogeneity of variance by the F test. If variances were homo geneous, data was analyzed by the Student t test, whereas heterogeneous data was analyzed by the Aspin-Welch t test ($p<0.05$, two-sided).

Results and discussion

Results of examinations

Clinical signs
no effects observed

Description (incidence and severity)
Reduced locomotor activity, salivation, or lacrimation were observed in males and females in the 25 mg/kg bw/day dose group 1-3 hours after the first dose in the pre-mating treatment period.
This change was recovered by withdraw.

Mortality
no mortality observed

Body weight and weight changes
effects observed, treatment-related

Description (incidence and severity)
In 6 mg/kg bw/day and 25 mg/kg bw/day groups in males, body weight gain were significantly decreased.
In 100 mg/kg bw/day groups in maels, body weight on Day 8 and 15 of administration were significantly decreased and body weight, and weight gain were significantly decreased in administration period.
In 25 mg/kg bw/day and 100 mg/kg bw/day groups in females, body weight gains were significantly decreased.

Food consumption and compound intake (if feeding study)
effects observed, treatment-related

Description (incidence and severity)
At 25 mg/kg bw/day and 100 mg/kg bw/day in males, low food consumption was observed in the administration period.
At 6 mg/kg bw/day in females, low food consumption was observed on day 2 of the administration.
At 25 mg/kg bw/day in females, low food consumption was observed on days 2 and 8 of the administration, on day 20 of gestation, and day 2 of lactation.
At 100 mg/kg bw/day in females, low food consumption was observed on days 2 and 8 of the administration, on days 7 and 20 of gestation, and on days 2 and 4 of lactation.

Haematological findings
not examined

Clinical biochemistry findings
not examined

Urinalysis findings
not examined

Organ weight findings including organ / body weight ratios
effects observed, treatment-related

Description (incidence and severity)
A significant increase in absolute and relative liver weights was observed in males at 100 mg/kg bw/day.
The relative weights of the testes and epididymis were significantly higher, but the absolute weights did not change obviously, suggesting a change due to underweight.
At 6 mg/kg bw/day and 25 mg/kg bw/day, organ weights were not significantly different.
Higher relative weights of liver were significantly observed in females at 25 mg/kg bw/day and more.
At 100 mg/kg bw/day, the relative weights of the ovaries were significantly higher.
At 6 mg/kg bw/day, no significant differences were observed in any organ weights.

Gross pathological findings
no effects observed

Description (incidence and severity)
At 6 mg/kg bw/day, dimpling foci of the liver were observed in one male and diaphragmatic herniated nodules in one male. However, it was judged to be an incidental based on the incidence of their occurrence.

At 100 mg/kg bw/day, dark red foci and white foci of the liver were observed in one female. Histologically, extensive necrosis was seen consistent with gross abnormalities (dark red foci and white foci). This change was localized to a portion of multiple lobes, was accompanied by thrombus and hemorrhage, and was characterized by expression from the centrilobular zone to the intermediate zone.
These changes are frequent in dams from reproductive studies and are not seen with repeated dosing for 28 days and were therefore considered incidental.

Histopathological findings: non-neoplastic
effects observed, treatment-related

Description (incidence and severity)
At 25 mg/kg bw/day and 100 mg/kg bw/day both sexes, mild centrilobular hepatocellular hypertrophy in the liver was observed. This change was observed in most lobules, and the cytoplasm was slightly acidic ground-glass in the strong case.

Any other information on results incl. tables

Figures and Tables (in English) are available in the following full report of the study.

http://dra4.nihs.go.jp/mhlw_data/home/pdf/PDF102-70-5c.pdf

Applicant's summary and conclusion

Executive summary

The reproductive and developmental toxicity of triallylamine was investigated in accordance with a reproduction/developmental toxicity screening test (OECD TG 421) in rats. Triallylamine was administered via oral gavage at doses of 0 (vehicle: corn oil), 6, 25, or 100 mg/kg bw/day. Males (12/dose) were treated for 30 days, including a 14-day premating period and a subsequent mating period. Females (12/dose) were treated for 40–47 days, including 14-day premating, mating, and gestation periods, until lactation day 3.

There were no treatment-related deaths in either sex. Decreased locomotor activity, salivation, and lacrimation were observed at the beginning of the treatment period in both sexes treated with ≥ 25 mg/kg bw/day. Body weight gain was decreased in males treated with ≥ 6 mg/kg bw/day and females treated with ≥ 25 mg/kg bw/day. Food consumption decreased in both sexes treated with ≥ 25 mg/kg bw/day. Similar to the 28-day repeated-dose toxicity study described above, treatment with 25 mg/kg bw/day triallylamine showed effects in the liver and increased organ weights with histopathological changes.

Genetic toxicity

Genetic toxicity in vitro

ENDPOINT_STUDY_RECORD: Genetic toxicity in vitro.001

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Dossier UUID:
Author:
Date: 2022-12-16T15:56:07.797+09:00
Remarks:

Administrative data

Endpoint
in vitro gene mutation study in bacteria

Type of information
experimental study

Adequacy of study
key study

Robust study summary
false

Used for classification
false

Used for SDS
false

Reliability
1 (reliable without restriction)

Rationale for reliability incl. deficiencies
guideline study
Reliability 1

Data source

Reference

A reverse mutation test of triallylamine using bacteria / Ministry of Health, Labour and Welfare(MHLW), Japan / publication

Data access
data published

Materials and methods

Test guideline

Qualifier
according to guideline

Guideline
OECD Guideline 471 (Bacterial Reverse Mutation Assay)

in vitro gene mutation study in bacteria

Deviations
no

GLP compliance
yes

Type of assay
bacterial reverse mutation assay
in vitro gene mutation study in bacteria

Test material

Specific details on test material used for the study
triallylamine / 102-70-5

Method

Species / strain

Species / strain / cell type
S. typhimurium TA 1535, TA 1537, TA 98, TA 100 and TA 102
bacteria

Species / strain / cell type
E. coli WP2 uvr A
bacteria

Metabolic activation
with and without

Metabolic activation system
S9 mix, SD male rat liver, induced by phenobarbital (PB) and 5,6-benzoflavone (BF)

Test concentrations with justification for top dose
To set the dose levels for the main tests, the 50 mg/mL solution was diluted 4 times using a common ratio of 4 and a total of 5 dose levels were selected (19.5, 78.1, 313, 1250 and 5000 µg/plate) in the dose-selection test.
In the dose-selection test, growth inhibition by the test substance was observed at 1250 µg/plate and above for S. typhimurium TA strains without metabolic activation, at 5000 µg/plate for E. coli WP2 uvrA without metabolic activation, and at 313 µg/plate and above for all bacterial strains with metabolic activation. Neither precipitation of nor coloration by the test substance on the plate was observed at any dose level irrespective of the presence or absence of metabolic activation.
Therefore, in the main tests, the lowest dose levels at which cell growth inhibition was observed in the dose-selection test were set as the highest dose levels 1250 µg/plate for S. typhimurium TA strains without metabolic activation, 5000 µg/plate for E. coli WP2 uvrA without metabolic activation, and 313 µg/plate for all bacterial strains with metabolic activation , and a total of 6 dose levels were selected by 5-step dilution using a common ratio of 2.

Vehicle / solvent
DMSO

Controls

Untreated negative controls
no

Negative solvent / vehicle controls
yes

True negative controls
no

Positive controls
yes

Positive control substance
sodium azide
benzo(a)pyrene
other: 2-(2-Furyl)-3-(5-nitro-2-furyl)acrylamide (AF-2) 2-Methoxy-6-chloro-9-[3-(2-chloroethyl)-aminopropylamino]acridine.2HCl (ICR-191) 2-Aminoanthracene (2AA)

Details on test system and experimental conditions
METHOD OF APPLICATION: Preincubation
DURATION
- Preincubation period: 20 min

Exposure duration: ca. 50 hours
NUMBER OF REPLICATIONS: 3
DETERMINATION OF CYTOTOXICITY
- Method: Cell growth

Evaluation criteria
If two-fold increase in the number of revertant colonies on the test plates or more was observed in comparison with the number of natural revertant colonies (the negative control) and dose response and reproducibility were noted, or if no clear dose response was observed but there was at least two-fold increase in comparison with the number of natural revertant colonies and reproducibility was obs erved in the two main tests, the test substance was judged to be positive. For the results of measu rement, mean with standard deviation was also indicated.

Statistics
not use

Any other information on materials and methods incl. tables

Results and discussion

Test results

Key result
false

Species / strain
S. typhimurium TA 1535
bacteria

Metabolic activation
without

Genotoxicity
positive

Cytotoxicity / choice of top concentrations
cytotoxicity 1250 ug/plate

Vehicle controls validity
valid

Positive controls validity
valid

Key result
false

Species / strain
S. typhimurium TA 100
bacteria

Metabolic activation
without

Genotoxicity
positive

Cytotoxicity / choice of top concentrations
cytotoxicity 1250 ug/plate

Vehicle controls validity
valid

Positive controls validity
valid

Key result
false

Species / strain
S. typhimurium TA 98
bacteria

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity / choice of top concentrations
cytotoxicity 1250 ug/plate without activation, 313 ug/plate with activation

Vehicle controls validity
valid

Positive controls validity
valid

Key result
false

Species / strain
S. typhimurium TA 1537

bacteria

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity / choice of top concentrations
cytotoxicity 1250 ug/plate without activation, 313 ug/plate with activation

Vehicle controls validity
valid

Positive controls validity
valid

Key result
false

Species / strain
E. coli WP2 uvr A
bacteria

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity / choice of top concentrations
cytotoxicity 5000 ug/plate without activation, 313 ug/plate with activation

Vehicle controls validity
valid

Positive controls validity
valid

Additional information on results
TEST-SPECIFIC CONFOUNDING FACTORS
- Precipitation: Precipitation was not observed on any plates with/without metabolic activation.
- Other effects: coloring was observed on plates with concentration of 1250 µg/plate or more with/w ithout metabolic activation in range-finding studies.
RANGE-FINDING/SCREENING STUDIES:
In range-finding studies, growth inhibition was observed on plates with concentration of 1250 µg/ plate or more in all S. typhimurium strains with/without metabolic activation and on plates with concentrate on of 5000 µg/plate in all E.coli strains with/without metabolic activation.
COMPARISON WITH HISTORICAL CONTROL DATA:
In all test conditions and in all tested strains, the number of revertant colonies of solvent controls and positive controls were within the range of historical control data.

Any other information on results incl. tables

Tables in English are attached.

Figures and Tables (in Japanese) are available in the following full report of the study.

http://dra4.nihs.go.jp/mhlw_data/home/pdf/PDF 102-70-5d.pdf

Applicant's summary and conclusion

Executive summary

In a bacterial reverse mutation assay using S. typhimurium TA100, TA1535, TA98, and TA1537 and E.coli WP2uvrA (OECD TG 471), triallylamine was positive without metabolic activation for TA1535 and TA100.

ENDPOINT_STUDY_RECORD: Genetic toxicity in vitro.002

UUID:	9b9a7c9e-94c5-453a-aa1f-ca9661a10c11
Dossier UUID:	
Author:	
Date:	2022-12-12T14:49:05.104+09:00
Remarks:	

Administrative data

Endpoint
in vitro cytogenicity / chromosome aberration study in mammalian cells

Type of information
experimental study

Adequacy of study
key study

Robust study summary
false

Used for classification
false

Used for SDS
false

Reliability
1 (reliable without restriction)

Rationale for reliability incl. deficiencies
guideline study
Reliability 1

Data source

Reference

Chromosome aberration test in cultured chinese hamster cells treated with triallylamine / Ministry of Health, Labour and Welfare(MHLW), Japan / publication

Data access
data published

Materials and methods

Test guideline

Qualifier
according to guideline

Guideline
OECD Guideline 473 (In Vitro Mammalian Chromosomal Aberration Test)
in vitro cytogenicity / chromosomal aberration study in mammalian cells (from 26 September 2014)

Deviations
no

GLP compliance
yes

Type of assay
in vitro mammalian chromosome aberration test
in vitro cytogenicity / chromosome aberration study in mammalian cells

Test material

Specific details on test material used for the study
triallylamine / 102-70-5

Method

Species / strain

Species / strain / cell type
Chinese hamster lung (CHL/IU)
mammalian cell line

Metabolic activation
with and without

Metabolic activation system
S9 mix, SD male rat liver, induced by phenobarbital (PB) and 5,6-benzoflavone (BF)

Test concentrations with justification for top dose
-S9 mix(short-term treatment): 0, 10.9, 21.9, 43.8, 87.5, 175, 350, 700, 1400 µg/mL
+S9 mix(short-term treatment): 0, 10.9, 21.9, 43.8, 87.5, 175, 350, 700, 1400 µg/mL
-S9 mix(24hr-continuous treatment): 0, 10.9, 21.9, 43.8, 87.5, 175, 350, 700, 1400 µg/ µg/mL
-S9 mix(48hr-continuous treatment): 0, 10.9, 21.9, 43.8, 87.5, 175, 350, 700, 1400 µg/ µg/mL

Cell-growth inhibition test was conducted up to the limited concentration of 1400 µg/mL (10 mM)

-Short term treatment, +S9 mix: concentration of 50% cell-growth inhibition was determined as 17.9µg/mL
-Short term treatment, -S9 mix: concentration of 50% cell-growth inhibition was determined as 1400 µg/mL

-Continous treatment (24 h): concentration of 50% cell-groth inhibition was determined as 1400 µg/mL
-Continous treatment (48 h): concentration of 50% cell-groth inhibition was determined as 1400 µg/mL

Vehicle / solvent
DMSO

Controls

Untreated negative controls
no

Negative solvent / vehicle controls
yes

True negative controls
no

Positive controls
yes

Positive control substance
cyclophosphamide
mitomycin C

Details on test system and experimental conditions
METHOD OF APPLICATION:
Exposure duration: [continuous treatment]: 24, 48 hrs [short-term treatment]:6 hrs + 18 hr
SPINDLE INHIBITOR: Colcemid
NUMBER OF REPLICATIONS: 2
NUMBER OF CELLS EVALUATED: 200 cells / dose
DETERMINATION OF CYTOTOXICITY
- Method: relative total growth

Evaluation criteria
For the evaluation of the frequencies of structural aberrations and of polyploidy induced, the following criteria were employed.
Appearance incidence of cells with chromosomal aberrations: Negative (-): < 5%; equivocal (±): 5 -10% ; positive (+): > 10%.
Finally, the substance is positive when the incidence is considered to be dose-related and reprod ucible.

Statistics
not used

Results and discussion

Test results

Key result
false

Species / strain
Chinese hamster lung (CHL/IU)
mammalian cell line

Metabolic activation
with

Genotoxicity
positive structural aberration

Cytotoxicity / choice of top concentrations
cytotoxicity yes: 50% cell growth inhibition: 17.9µg/mL (short , +S9) no: 50% cell growth inhibition: above 1400µg/mL (short , -S9)

Vehicle controls validity
valid

Positive controls validity
valid

Key result
false

Species / strain
Chinese hamster lung (CHL/IU)
mammalian cell line

Metabolic activation
with and without

Genotoxicity
other: equivocal chromosome numerical aberrations

Cytotoxicity / choice of top concentrations
cytotoxicity yes : 50% cell growth inhibition: 17.9μg/mL (short , +S9) yes : 50% cell growth inhibition: above 1400μg/mL (short , -S9)

Vehicle controls validity
valid

Positive controls validity
valid

Any other information on results incl. tables

Figures and Tables (in English) are available in the following full report of the study.

http://dra4.nihs.go.jp/mhlw_data/home/pdf/PDF 102-70-5f.pdf

Applicant's summary and conclusion

Executive summary

It was concluded that triallylamine is equivocal (minimally positive) for chromosome numerical aberration with and without metabolic activation and poisitive for chromosome structural aberration with metabolic activation under the conditions of this study.

Toxicity to reproduction

Toxicity to reproduction

ENDPOINT_STUDY_RECORD: Toxicity to reproduction.001

UUID:	612b23e7-fd84-452f-b46f-492926d30d9c
Dossier UUID:	
Author:	
Date:	2022-12-16T15:58:56.087+09:00
Remarks:	

Administrative data

Endpoint
screening for reproductive / developmental toxicity

Type of information
experimental study

Adequacy of study
key study

Robust study summary
false

Used for classification
false

Used for SDS
false

Reliability
1 (reliable without restriction)

Rationale for reliability incl. deficiencies
guideline study
Reliability 1

Cross-reference

Reason / purpose for cross-reference
reference to same study

Related information
OECD / Repeated dose toxicity: oral / Repeated dose toxicity: oral.002 / triallylamine / 102-70-5 / N,N-diallylprop-2-en-1-amine / 102-70-5

Remarks
Repeated dose toxicity: oral.002

Data source

Reference

A reproduction/developmental toxicity screening test in rats treated orally of triallylamine / Ministry of Health, Labour and Welfare (MHLW), Japan / publication

Data access
data published

Materials and methods

Test guideline

Qualifier
according to guideline

Guideline
other: Guideline for reproduction/developmental toxicity screening test in rats (Chemical Substa nces Control Law of Japan)

Deviations
no

GLP compliance
yes

Test material

Specific details on test material used for the study
triallylamine / 102-70-5

Test animals

Species
rat

Strain
other: Crl:CD(SD)

Sex
male/female

Details on test animals or test system and environmental conditions
TEST ANIMALS
- Source: Charles River Laboratories Japan, Inc. Atsugi
- Age at study initiation: 10 weeks
- Weight at study initiation: Males: 402 - 455 g; Females: 239 - 283 g
- Housing: bracket-type metallic wire-mesh cages (W 254 × D 350 × H 170 mm)
- Diet: ad libitum
- Water: ad libitum
- Acclimation period: 20 days

ENVIRONMENTAL CONDITIONS
- Temperature (°C): 23-24 (acceptable range:23±3 °C)
- Humidity (%): 42-53 (acceptable range:50±20 %)
- Air changes: 12-17 times / hr
- Photoperiod: 12 hrs dark / 12 hrs light

Administration / exposure

Route of administration
oral: gavage

Vehicle
corn oil

Details on mating procedure
Males and females in the same dose group were co-housed overnight on a one-to-one basis after the end of the pre-mating administration period. Copulation was considered successful if the formation of vaginal plugs or presence of sperm in vaginal smears was confirmed the following morning.

Details on analytical verification of doses or concentrations
Test solutions were prepared at least once in 8 days and used within 7 days of preparation.
The test solutions to be used for week 1 or week 6 of administration were analyzed for concentration by GC method at Gotemba Laboratory, Bozo Research Center Inc.
The results showed that the concentrations were 98.3 to 102.0% of the nominal concentrations (acceptable range: 100 ± 10% of the nominal value), which were all within the acceptable range.

Duration of treatment / exposure
Males were dosed for 30 days, including a 14-day pre-mating period and subsequent mating period.
Females were dosed for 40–47 days, including 14-day pre-mating, mating, and gestation periods, and until lactation day 3.

Frequency of treatment
once a day

Doses / concentrations

Dose / conc.	
0	mg/kg bw/day (actual dose received)
Dose / conc.	
6	mg/kg bw/day (actual dose received)
Dose / conc.	
25	mg/kg bw/day (actual dose received)
Dose / conc.	
100	mg/kg bw/day (actual dose received)

No. of animals per sex per dose
12 animals/sex/dose

Details on study design
The dose levels of this study were selected based on the results of the previously conducted study, “A 28-day repeat dose oral toxicity test of triallylamine in rat with a recovery period of 2 weeks ”.

In that study, there was decreased body weight gain at 100 mg/kg bw/day, but no effects were found for reproductive organs.
Based on these results, the high dose in this reproduction/developmental toxicity screening test was s et at 100 mg/kg bw/day, and the lower doses were set at 6 mg/kg bw/day.

Examinations

Parental animals: Observations and examinations
CAGE SIDE OBSERVATIONS: Yes
Males and females: 3 times/day during the administration period (before and after dosing)

DETAILED CLINICAL OBSERVATIONS: Yes

Oestrous cyclicity (parental animals)
yes

Vaginal smears were collected from all females in the main groups and microscopically examined every day from the day after the start of administration until the day copulation was confirmed. During the pre-mating administration period, vaginal smear pictures were classified as proestrus, estrus, metestrus or diestrus and examined for the frequency of estrus and interval between estruses (estrous cycle). During the mating period, vaginal smears were examined for the presence of sperm.

Sperm parameters (parental animals)
no

Postmortem examinations (parental animals)
yes

Postmortem examinations (offspring)
yes

Statistics
The data were analyzed for homogeneity of variance by the Bartlett test. If variances were homogeneous, data was analyzed by the Dunnett test, whereas heterogeneous data was analyzed by the Steel test ($p<0.05$, two-sided).
2 groups: The data were analyzed for homogeneity of variance by the F test. If variances were homo geneous, data was analyzed by the Student t test, whereas heterogeneous data was analyzed by the Aspin-Welch t test ($p<0.05$, two-sided).

Especially, Implantation index, Stillborn index, Liveborn index, External abnormalities, Viability ind ex: the Steel test ($p<0.05$ and <0.01, two-sided) Copulation index, Fertility index, Insemination index, Delivery index: Fisher's exact test ($p<0.05$ and <0.01, two-sided)

Reproductive indices
Copulation index (%) = (No. of copulated animals/No. of co-housed animals) × 100
Fertility index (%) = (No. of pregnant females/No. of copulated females) × 100
Insemination index (%) = (No. of pregnant females/No. of copulated males) × 100
Duration of gestation (days) = day 0 of lactation – day 0 of gestation
Delivery index (%) = (No. of females delivered liveborn pups/No. of pregnant females) × 100
Implantation index (%) = (No. of implantation sites/No. of corpora lutea) × 100

Stillborn index (%) = (No. of stillborn pups/Total No. of pups born) × 100
Liveborn index (%) = (No. of liveborn pups/Total No. of pups born) × 100
External abnormalities (%) = (No. of pups with external abnormalities/No. of liveborn pups) × 100
Live birth index (%) = (No. of liveborn pups / No. of implantation sites) × 100
Sex ratio on day 0 after birth = No. of liveborn male pups/(No. of liveborn male pups + No. of liveborn female pups)
Sex ratio on day 4 after birth = No. of liveborn male pups on day 4 after birth/(No. of liveborn male pups + No. of liveborn female pups) on day 4 after birth

Offspring viability indices
Viability index = (Number of live pups on day 4 after birth/Number of live pups born) ×100

Results and discussion

Results: P0 (first parental generation)

General toxicity (P0)

Clinical signs
no effects observed

Mortality
no mortality observed

Body weight and weight changes
effects observed, treatment-related

Description (incidence and severity)
In 6 mg/kg bw/day and 25 mg/kg bw/day groups in males, body weight gains were significantly decreased.
In 100 mg/kg bw/day groups in males, body weights on Day 8 and 15 of administration were significantly decreased, and body weight and weight gain were significantly decreased in the administration period.
In 25 mg/kg bw/day and 100 mg/kg bw/day groups in females, body weight gains were significantly decreased in the pregnancy period.

Food consumption and compound intake (if feeding study)
effects observed, treatment-related

Description (incidence and severity)
At 25 mg/kg bw/day in males and at 6 mg/kg bw/day in females, low food consumption was observed in the administration period.

At 25 mg/kg bw/day and 100 mg/kg bw/day in males, low food consumption was observed in the administration period.
At 6 mg/kg bw/day in females, low food consumption was observed on day 2 of the administration.
At 25 mg/kg bw/day in females, low food consumption was observed on days 2 and 8 of the administration, on day 20 of gestation, and on day 2 of lactation.
At 100 mg/kg bw/day in females, low food consumption was observed on days 2 and 8 of the administration, on days 7 and 20 of gestation, and on days 2 and 4 of lactation.

Organ weight findings including organ / body weight ratios
effects observed, treatment-related

Description (incidence and severity)
A significant increase in absolute and relative liver weights was observed in males at 100 mg/kg bw/day.
The relative weights of the testes and epididymis were significantly higher, but the absolute weights did not change obviously, suggesting a change due to underweight.
At 6 mg/kg bw/day and 25 mg/kg bw/day, organ weights were not significantly different.
Higher relative weights of liver were significantly observed in females at 25 mg/kg bw/day and more.
At 100 mg/kg bw/day, the relative weights of the ovaries were significantly higher.
At 6 mg/kg bw/day, no significant differences were observed in any organ weights.

Reproductive function / performance (P0)

Reproductive function: oestrous cycle
no effects observed

Reproductive performance
no effects observed

Description (incidence and severity)
In the control group, mating was observed by day 4 of mating initiation, with the exception of one animal (mated on day 7 of mating initiation). At 25 mg/kg bw/day and 100 mg/kg bw/day, each one female was observed to be infertile. This was judged as an incidental change because there were no abnormalities in the pathological examination of the genital organs and accessory genital organs of male and female animals.

Results: P1 (second parental generation)

Effect levels (P1)

Key result
false

Results: F1 generation

General toxicity (F1)

Clinical signs
no effects observed

Mortality / viability
no mortality observed

Body weight and weight changes
effects observed, treatment-related

Description (incidence and severity)
There was no significant difference in body weight between males and females on the day of birth between the control group and each triallylamine administration group.

At 25 mg/kg bw/day, males and females, the lower body weight of at 4 days after birth were observed tendency, at 100 mg/kg bw/day, the lower body weight were observed significantly.

Effect levels (F1)

Key result
false

Dose descriptor
NOAEL

Effect level

6 mg/kg bw/day (actual dose received)

Based on
test mat.

Sex
male/female

Basis for effect level
body weight and weight gain
At 25 mg/kg bw/day and 100 mg/kg bw/day, the lower body weight were observed in males and females pups on PND 4.

Any other information on results incl. tables

Figures and Tables (in English) are available in the following full report of the study.

http://dra4.nihs.go.jp/mhlw_data/home/pdf/PDF102-70-5c.pdf

Applicant's summary and conclusion

Conclusions
Based on the effects in body weight of pups at 25 mg/kg bw/day group, the NOAEL of reproductive and developmental toxicity was considered to be 6 mg/kg bw/day.

Executive summary

The reproductive and developmental toxicity of triallylamine was investigated in accordance with a reproduction/developmental toxicity screening test (OECD TG 421) in rats. Triallylamine was administered via oral gavage at doses of 0 (vehicle: corn oil), 6, 25, or 100 mg/kg bw/day. Males (12/dose) were treated for 30 days, including a 14-day premating period and a subsequent mating period. Females (12/dose) were treated for 40–47 days, including 14-day premating, mating, and gestation periods, until lactation day 3.

There were no treatment-related deaths in either sex. Decreased locomotor activity, salivation, and lacrimation were observed at the beginning of the treatment period in both sexes treated with ≥ 25 mg/kg bw/day. Body weight gain was decreased in males treated with ≥ 6 mg/kg bw/day and females treated with ≥ 25 mg/kg bw/day. Food consumption decreased in both sexes treated with ≥ 25 mg/kg bw/day. Similar to the 28-day repeated-dose toxicity study described above, treatment with25 mg/kg bw/day triallylamine showed effects in the liver and increased organ weights with histopathological changes. No effects on reproductive organs and fertility were observed following triallylamine treatment. Analysis of developmental toxicity showed decreased body weight in male pups in the 100 mg/kg bw/day group and a tendency to decrease in male pups at 25 mg/kg bw/day group and female pups at 25 and 100 mg/kg bw/day groups on postnatal day (PND) 4. Based on the effects in body weight of pups at 25 mg/kg bw/day group, the NOAEL of reproductive and developmental toxicity was considered to be 6 mg/kg bw/day.

References

Reference Substances

REFERENCE_SUBSTANCE: triallylamine

UUID: ECB5-d00ced4f-84ac-4ad4-95d6-505ef818c3f0
Dossier UUID:
Author:
Date: 2007-05-10T18:00:00.000+09:00
Remarks:

Reference substance name
triallylamine

IUPAC name
N,N-diallylprop-2-en-1-amine

Inventory

Inventory number

Inventory name
triallylamine

Inventory
EC Inventory

Inventory number
203-048-2

CAS number
102-70-5

Molecular formula
C9H15N

Description

CAS number
102-70-5

Synonyms

Synonyms

Identity
2-Propen-1-amine, N,N-di-2-propenyl-

Identity
2-Propen-1-amine, N,N-di-2-propenyl-

Molecular and structural information

Molecular formula
C9H15N

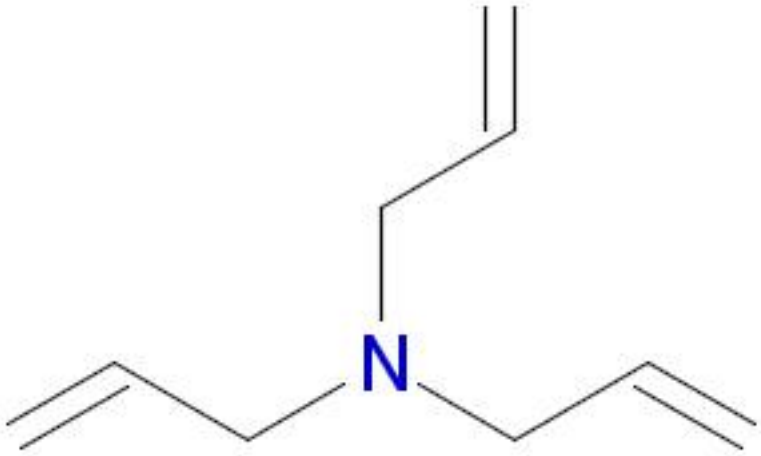
Molecular weight

137.2221

SMILES notation
C=CCN(CC=C)CC=C

InChI
InChI=1/C9H15N/c1-4-7-10(8-5-2)9-6-3/h4-6H,1-3,7-9H2

Structural formula



Related substances

Group / category information
USEPA Category: Aliphatic Amines

Literatures

LITERATURE: A 28-day repeat dose oral toxicity test of triallylamine in rat with a recovery period of 2 weeks

UUID:	f1185455-0792-41b2-9153-bfc87d93d278
Dossier UUID:	
Author:	
Date:	2019-05-21T16:59:04.000+09:00
Remarks:	

General information

Reference Type
publication

Title
A 28-day repeat dose oral toxicity test of triallylamine in rat with a recovery period of 2 weeks

Author
Ministry of Health, Labour and Welfare(MHLW), Japan

Year
2011

Testing facility
Gotemba Laboratory, Bozo Research Center Inc.

LITERATURE: A reproduction/developmental toxicity screening test in rats treated orally of triallylamine

UUID:	5f875192-46cc-41f8-b4f6-49dcdf76c1e4
Dossier UUID:	
Author:	
Date:	2019-03-26T17:01:02.000+09:00
Remarks:	

General information

Reference Type
publication

Title
A reproduction/developmental toxicity screening test in rats treated orally of triallylamine

Author
Ministry of Health, Labour and Welfare (MHLW), Japan

Year
2014

LITERATURE: A reverse mutation test of triallylamine using bacteria

UUID:	42908206-fe83-49ad-a781-7e95ecb31d19
Dossier UUID:	
Author:	
Date:	2019-05-21T16:52:29.000+09:00
Remarks:	

General information

Reference Type
publication

Title
A reverse mutation test of triallylamine using bacteria

Author
Ministry of Health, Labour and Welfare(MHLW), Japan

Year
2009

LITERATURE: Chromosome aberration test in cultured chinese hamster cells treated with triallylamine

UUID:	95039b29-0c90-477f-bedc-716d67064c4f
Dossier UUID:	
Author:	
Date:	2019-05-22T11:15:32.000+09:00
Remarks:	

General information

Reference Type
publication

Title
Chromosome aberration test in cultured chinese hamster cells treated with triallylamine

Author
Ministry of Health, Labour and Welfare(MHLW), Japan

Year
2010

Legal Entities

LEGAL_ENTITY: National Institute of Health Sciences

UUID: IUC4-b036ff75-0f3c-323b-b200-ed5f46cf5101
Dossier UUID:
Author:
Date: 2022-11-07T15:49:29.000+09:00
Remarks:

General information

Legal entity name
National Institute of Health Sciences

Remarks
Disclaimer: The contents in this document were created based on the MHLW (Ministry of Health, Labour and Welfare) peer reviewed study reports (in Japanese) in JECDB (Japan Existing Chemical Database) at http://dra4.nihs.go.jp/mhlw_data/jsp/SearchPageENG.jsp. Authorship is in the Division of Risk Assessment, the National Institute of Health Sciences, and the contents do not reflect any o fficial MHLW opinions or any other regulatory policies.

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Postal code
210-9501

Town
Kawasaki

Region / State
Kanagawa

Country
Japan
JP

Identifiers

Other IT system identifiers

IT system LEO **ID** 10767
IT system IUCLID4

ID
16558402024DIV750