Name: 4-Chlorobenzaldehyde / 4-chlorobenzaldehyde / 104-88-1

Legal entity owner: National Institute of Health Sciences / Tokyo / Japan

Printing date: 2018-02-26T15:55:13.404+09:00

Table of Contents

4-Chlorobenzaldehyde

CORE

General information

Identification

SUBSTANCE: 4-Chlorobenzaldehyde

UUID:	IUC5-88396134-556c-42ba-b624-833db483f5ce
Dossier UUID:	
Author:	SuperUser
Date:	2016-12-21T15:12:44.000+09:00
Remarks:	

Substance name
4-Chlorobenzaldehyde

Legal entity
National Institute of Health Sciences / Tokyo / Japan

Identification of substance

Reference substance
4-chlorobenzaldehyde / 4-chlorobenzaldehyde / 104-88-1 / 203-247-4

EC number	EC name
203-247-4	EC Inventory
CAS number	**CAS name**
104-88-1	
IUPAC name	
4-chlorobenzaldehyde	

Role in the supply chain

Manufacturer
false

Importer
false

Only representative
false

Downstream user
false

OECD

Health Effects

Repeated dose toxicity: oral

ENDPOINT_STUDY_RECORD: Repeated dose toxicity: oral.001

UUID: IUC5-5c3897a9-5e38-496d-977f-60a8fb98a9cb
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T11:42:25.000+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
other: The study was conducted in accordance with Test Guidelines and under GLP

Cross-reference

Reason / purpose
reference to other study

Remarks
7.5.1 Repeated dose toxicity: oral.002

Data source

Reference

Twenty-eight-day Repeat Dose Oral Toxicity Test of 4-Chlorobenzaldehyde in Rats / MHLW / publication

Data access
data published

Materials and methods

Test guideline

Qualifier
according to

Guideline
other: other guideline: Guideline for 28-Day Repeated Dose Toxicity Test in Mammalian Species (Chemical Substances Control Law of Japan)

Qualifier
equivalent or similar to

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

GLP compliance
yes

Test material

Test material information
4-chlorobenzaldehyde / 104-88-1 / 203-247-4

Test animals

Species
rat
common rodent species

Strain
other: Crl:CD(SD)

Sex
male/female

Details on test animals and environmental conditions
TEST ANIMALS
- Source: Charles River Japan, Inc.
- Age at study initiation: 5 weeks old
- Weight at study initiation: male (150-177 g), female (114-131 g)
- Housing: Animals were individually housed in a metallic cage with wire mesh bottoms
- Diet: Solid feed (CRF-1: Oriental Yeast Co., ltd.) was given ad libitum.
- Water: Tap water was given ad libitum.
- Acclimation and quarantine period:6 days

ENVIRONMENTAL CONDITIONS
- Temperature (°C): 22±3 (actual temperature: 21-25 ℃)
- Humidity (%): 50±20% (actual humidity: 39-56%)
- Air changes (per hr): 10-15
- Photoperiod (hrs dark / hrs light): 12 hr dark/12 hr light (light: 8:00~20:00)

Administration / exposure

Route of administration
oral: gavage

Vehicle
corn oil

Analytical verification of doses or concentrations
yes

Duration of treatment / exposure
28 days

Frequency of treatment
once a day

Doses / concentrations

Remarks
Doses / Concentrations:
0, 8, 40, 200, 1000 mg/kg bw/day
Basis:
actual ingested

No. of animals per sex per dose
12/sex (0, 1000 mg/kg bw/day)
6/sex (8, 40, 200 mg/kg bw/day)

Control animals
yes, concurrent vehicle

Details on study design
- Dose selection rationale:
The dosage levels were determined based on the finding in a 14-day dose-finding study.
In a dose finding study for a 28 day study, Crl:CD(SD) rats were given 4-chlorobenzaldehyde at 0 (corn oil), 8, 40, 200 or 1000 mg/kg/day for 14 days. At 40 mg/kg/day and higher, the urine specific gravity in males was showed a decreasing trend, at 200 mg/kg/day and higher, urine protein in males and females was decreased or showed a decreasing trend, and at 1000 mg/kg/day, an increase in urine volume in males and females, and increases in AST, ALT and ALP in females were observed.

- Rationale for animal assignment (if not random): Body weight-balanced randomization
- Post-exposure recovery period in satellite groups: 14 days

Examinations

Observations and examinations performed and frequency
CLINICAL OBSERVATIONS: Yes
- Time schedule: every day during the administration (twice a day: am and pm) and recovery periods (twice a day: am and pm).
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. Ther eafter, 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 (reco very group animals).
BODY WEIGHT: Yes
- Time schedule for examinations: Before administration (on days 1, 7, 14, 21 and 28 of the admin istration period, days 7 and 14 of the recovery period) and the necropsy days after completion of e very period.
FOOD CONSUMPTION AND COMPOUND INTAKE (if feeding study):
- Food consumption: Yes. Before administration (on days 1, 7, 14, 21 and 28 of the administration per iod and days 7 and 14 of the recovery period)

OPHTHALMOSCOPIC EXAMINATION: No
HAEMATOLOGY: Yes
- Time schedule for collection of blood: the after completion of the administration and recovery perio ds
- Anaesthetic used for blood collection: ether
- Animals fasted: Yes (16-22 hours)
- How many animals: all animals
CLINICAL CHEMISTRY: Yes
- Time schedule for collection of blood: the day after completion of the administration and recovery periods
- Animals fasted: Yes
- How many animals: all animals
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: No
- How many animals: all animals
NEUROBEHAVIOURAL EXAMINATION: No

Sacrifice and pathology
GROSS PATHOLOGY: Yes

ORGAN WEIBHT: Yes [brain, pituitary gland, thyroid, adrenal, spleen, heart, liver, kidney, thymus, testis, epididymis, prostate, seminal vescles (including coagulation gland), ovary, uterus]

HISTOPATHOLOGY: Yes [brain (cerebrum, cerebellum and medulla oblongata), pituitary gland, spi nal cord, thymus, thyroid, parathyroid, adrenal glands, spleen, heart, tongue, esophagus, stomach, liver, pancreas, duodenum, jejunum, ileum (including Peyer's patches), cecum, colon, rectal, mesent eric lymph nodes, submandibular lymph nodes, trachea, lung, kidney, bladder, testis, epididymis, pr ostate, seminal vesicles (including coagulation glands) , ovary, uterus, vagina, eye, Harder gland, femur (including bone marrow, right) and the sciatic nerve. (see tables in the study report.)

Statistics
The homoscedasticity was analyzed by Bartlett’s test for data of grip strength, motor activity, body weight, body weight gain, food consumption, quantitive items of urinary findings (except for the urine specific gravity), hematological test, biochemical test, organ weight and organ weight ratio. When homogeneity was recognized, one-way analysis of variance (homogeneous data) or kruskal-wallis (non-homogenous data) was conducted. If a significant difference was detected, as the result of one-way analysis of variance, Dunnett’s method was applied for comparisons between control and indivi dual treatment groups. And in the case of a significant difference was detected on kruskal-wallis, Mann-Whitney’s U-test was applied for the same purpose. The trend by the group was analyzed by Kruskal-Wallis for general appearance, detailed clinical observation, qualitative items of urinary find ings, and urine specific gravity. If a significant difference was detected as the result of kruskal-wallis, Mann-Whitney’s U-test as applied for comparisons between control and individual treatment groups.

Results and discussion

Results of examinations

Clinical signs
effects observed, treatment-related

Description (incidence and severity)
(see Details on results)

Mortality
mortality observed, treatment-related

Description (incidence)
(see Details on results)

Body weight and weight changes
effects observed, treatment-related

Description (incidence and severity)
(see Details on results)

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

Description (incidence and severity)
(see Details on results)

Haematological findings
effects observed, treatment-related

Description (incidence and severity)
(see Details on results)

Clinical biochemistry findings
effects observed, treatment-related

Description (incidence and severity)
(see Details on results)

Urinalysis findings
effects observed, treatment-related

Description (incidence and severity)
(see Details on results)

Behaviour (functional findings)
effects observed, treatment-related

Description (incidence and severity)
(see Details on results)

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

Description (incidence and severity)
(see Details on results)

Gross pathological findings
effects observed, treatment-related

Description (incidence and severity)
(see Details on results)

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

Description (incidence and severity)
(see Details on results)

Details on results
CLINICAL SIGNS AND MORTALITY
Transient salivation and tremors were observed in both sexes at 1,000 mg/kg bw/day. Soiled fur was observed in females at 1,000 mg/kg bw/day.

BODY WEIGHT AND WEIGHT GAIN

At 1,000 mg/kg bw/day, a decrease in body weight gain was observed in males.

FOOD CONSUMPTION
At 1,000 mg/kg bw/day, an increase in food consumption was observed in females.

HAEMATOLOGY
At 1,000 mg/kg bw/day, a decrease in platelet was observed in males.

CLINICAL CHEMISTRY
At 1,000 mg/kg bw/day, increases in serum aspartate aminotransferase and alanine aminotransferase levels were observed in both sexes, whereas decreases in total protein and β-globulin fraction were observed in males, and increases in alkaline phosphatase and triglyceride levels were observed in fe males.

URINALYSIS
At 1,000 mg/kg bw/day, an increase in urine volume in males and females and decreases in urine pH and protein and specific gravity levels in males were observed.

NEUROBEHAVIOUR
At 1,000 mg/kg bw/day, a decrease in grip strength of forearms was observed in males, and a decrease in the locomotor activity was observed in females.

ORGAN WEIGHTS
Increased liver weight and decreased ovary and heart weights were observed at 1,000 mg/kg bw/day in females.

GROSS PATHOLOGY
At 1,000 mg/kg bw/day, atrophy of lateral vastus muscle in one male and multifocal mucosal black patch in glandular stomach in one female were observed.

HISTOPATHOLOGY: NON-NEOPLASTIC
Histopathological examinations revealed hyperostosis metaphysis of the femur in females at 200 mg/kg bw/day. Furthermore, at 1,000 mg/kg bw/day, hyperkeratosis of the mucosal epithelium in the forestomach, grade enhancement of regeneration of the tubular epithelium, dilatation of the renal tubules in the cortex, and cyst-like extension of the collecting duct in the kidney, and hyperostosis me taphysis of the femur were observed in both sexes. Additionally in males at 1,000 mg/kg bw/day, deg eneration of nerve fibers in the sciatic nerve and atrophy of muscle fibers in the skeletal muscle were observed. And in females at 1,000 mg/kg bw/day, squamous cell hyperplasia of the boundary edge in the stomach was observed. These changes tended to resolve after the recovery period.

Effect levels

Dose descriptor
NOAEL

Effect level

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

Based on
test mat.

Sex
male

Basis for effect level
other: see 'Remark'

At 1,000 mg/kg bw/day in males: Transient salivation and tremors were observed, and decreases in body weight gain and grip strength of forearms were observed, increases in serum aspartate aminotransferase and alanine aminotransferase levels, decreases in total protein and β-globulin fraction were observed, and hyperkeratosis of the mucosal epithelium in the forestomach, grade enhancement of regeneration of the tubular epithelium, dilatation of the renal tubules in the cortex, and cyst-like extension of the collecting duct in the kidney, and hyperostosis metaphysis of the femur were observed. Additionally, degeneration of nerve fibers in the sciatic nerve and atrophy of muscle fibers in the skeletal muscle were observed.

Dose descriptor
NOAEL

Effect level

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

Based on
test mat.

Sex
female

Basis for effect level
other: Histopathological examinations revealed hyperostosis metaphysis of the femur in females at 200 mg/kg bw/day.

Target system / organ toxicity

Key result
false

Critical effects observed
not specified

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/PDF104 -88 -1b.pdf

Applicant's summary and conclusion

Executive summary

In a 28-day repeated-dose toxicity test performed according to OECD TG 407, male and female rats (6 animals/sex/dose) were administered 4-chlorobenzaldehyde at 0, 8, 40, 200, and 1,000 mg/kg bw/day. In addition, both sexes (6 animals/sex/dose) were administered 0 and 1,000 mg/kg bw/day of this substance for 28 days and examined after a 14-day recovery period. At 1,000 mg/kg bw/day, transient salivation and tremors were observed in both sexes, decreases in body weight gain and grip strength of forearms were observed in males, and a decrease in the locomotor activity was observed in females. At this dose, increases in serum aspartate aminotransferase and alanine aminotransferase levels were observed in both sexes, whereas decreases in total protein and β-globulin fraction were observed in males, and increases in alkaline phosphatase and triglyceride levels were observed in

females. Increased liver weight and decreased ovary weight were also observed at 1,000 mg/kg bw/day in females. Histopathological examinations revealed hyperostosis metaphysis of the femur in females at 200 mg/kg bw/day. Furthermore, at 1,000 mg/kg bw/day, hyperkeratosis of the mucosal epithelium in the forestomach, grade enhancement of regeneration of the tubular epithelium, dilatation of the renal tubules in the cortex, and cyst-like extension of the collecting duct in the kidney, and hyperostosis metaphysis of the femur were observed in both sexes. Additionally in males at 1,000 mg/kg bw/day, degeneration of nerve fibers in the sciatic nerve and atrophy of muscle fibers in the skeletal muscle were observed. And in females at 1,000 mg/kg bw/day, squamous cell hyperplasia of the boundary edge in the stomach was observed. These changes tended to resolve after the recovery period. On the basis of these effects, NOAELs for repeated-dose toxicity were determined to be 200 mg/kg bw/day and 40 mg/kg bw/day in male and female rats, respectively.

ENDPOINT_STUDY_RECORD: Repeated dose toxicity: oral.002

UUID: IUC5-520d8d8b-7f48-4e05-b483-817f6ebe17ce
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T11:45:20.000+09:00
Remarks:

Administrative data

Endpoint
repeated dose toxicity: oral combined repeated dose and reproduction / developmental screening deactivated phrase

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
other: GLP guideline study

Cross-reference

Reason / purpose
reference to same study

Remarks
7.8.1 Toxicity to reproduction.001

Reason / purpose
reference to other study

Remarks
7.5.1 Repeated dose toxicity: oral.001

Data source

Reference

A reproduction/developmental toxicity screening test in rats treated orally with 4-chlorobenzaldehyd... / MHLW Japan / study report

Data access
data published

Materials and methods

Test guideline

Qualifier
according to

Guideline
other: OECD TG 421: Reproduction/developmental toxicity screening test

Deviations
no

GLP compliance
yes

Limit test
no

Test material

Test material information
4-chlorobenzaldehyde / 104-88-1 / 203-247-4

Test animals

Species
rat
common rodent species

Strain
other: Crl: CD(SD)

Sex
male/female

Details on test animals and environmental conditions
TEST ANIMALS
- Source: Charles River Laboratories Japan, Inc. Tsukuba
- Age at study initiation: 10 weeks
- Weight at study initiation: Males: 389-449 g; Females: 234-271 g
- Housing: Steel wire-mesh cage (250 mm x 350 mm x 200 mm)
- Diet: ad libitum
- Water: ad libitum
- Acclimation period: 14 days

ENVIRONMENTAL CONDITIONS
- Temperature (°C): 20-25
- Humidity (%): 41-69
- Air changes: 10-15 times / hr
- Photoperiod: 12 hrs dark / 12 hrs light (07:00-19:00)

Administration / exposure

Route of administration
oral: gavage

Vehicle
corn oil

Analytical verification of doses or concentrations
yes

Duration of treatment / exposure
(P) Males: 42 days including 14 days pre-mating and mating periods, and thereafter 14 days (P) Females: 42-45 days including 14 days pre-mating, mating and gestation periods, and the days until day 4 of lactation

Frequency of treatment
Once/day, 7days/week

Doses / concentrations

Remarks
Doses / Concentrations:
0 (vehicle), 40, 200, and 1000 mg/kg bw/day
Basis:
actual ingested

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

Control animals
yes, concurrent vehicle

Details on study design
- Dose selection rationale: Doses in this test were set based on the results of the following study: 28-day repeated dose oral toxicity test (doses: 0, 8, 40, 200, and 1000 mg/kg bw/day). At 1,000 mg/kg bw/day, transient salivation and tremors were observed in both sexes, decreases in body weight gain and grip strength of forearms were observed in males, and a decrease in the locomotor activity was observed in females. At this dose, increases in serum aspartate aminotransferase and alanine a minotransferase levels were observed in both sexes, whereas decreases in total protein and β-globul in fraction were observed in males, and increases in alkaline phosphatase and triglyceride levels w ere observed in females. Increased liver weight and decreased ovary weight were also observed at 1,000 mg/kg bw/day in females. Histopathological examinations revealed hyperostosis metaphysis of the femur in females at 200 mg/kg bw/day. Furthermore, at 1,000 mg/kg bw/day, hyperkeratosis of the mucosal epithelium in the forestomach, grade enhancement of regeneration of the tubular epit helium, dilatation of the renal tubules in the cortex, and cyst-like extension of the collecting duct in the kidney, and hyperostosis metaphysis of the femur were observed in both sexes. Additionally in males at 1,000 mg/kg bw/day, degeneration of nerve fibers in the sciatic nerve and atrophy of muscle fibers in the skeletal muscle were observed. And in females at 1,000 mg/kg bw/day, squamous cell hype rplasia of the boundary edge in the stomach was observed. These changes tended to resolve after the recovery period.
- Rationale for animal assignment (if not random): Body weight-balanced randomization

Examinations

Observations and examinations performed and frequency
CAGE SIDE OBSERVATIONS: Yes
- Time schedule:
Males and females: 3 times/day

BODY WEIGHT: Yes
- Time schedule for examinations:
Males: Days 1, 4, 8, 11, 15, 22, 25, 29, 32, 36, 39, 42, and the day of necropsy

Females: Twice a week during the precopulation period (days 1, 4, 8, 11, and 15); gestation days 0, 4, 7, 11, 14, 17, and 20; lactation days 0 and 4; and the day of necropsy

FOOD CONSUMPTION: Yes
Males: Days 1, 4, 8, 11, 15, 32, 36, 39, and 42 in dosing period
Females: Days 1, 4, 8, 11, and 15; gestation days 1, 4, 7, 11, 14, 17, and 20; lactation days 2 and 4

HAEMATOLOGY: No

CLINICAL CHEMISTRY: No

URINALYSIS: No

Sacrifice and pathology
GROSS PATHOLOGY: Yes (see tables)
HISTOPATHOLOGY: Yes (epididymis, prostate, seminal vesicle, testis, ovary, uterus, vagina, and gross abnormal sites)

Other examinations
Organ weight: Testes and epididymides

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).

Results and discussion

Results of examinations

Clinical signs
effects observed, treatment-related

Description (incidence and severity)
Nine males and seven females died with tremors and decreased locomotor activity at 1,000 mg/kg bw/day by day 9 of administration.

Mortality
mortality observed, treatment-related

Description (incidence)
Nine males and seven females died with tremors and decreased locomotor activity at 1,000 mg/kg bw/day by day 9 of administration.

Body weight and weight changes
effects observed, treatment-related

Description (incidence and severity)
Low value of body weight was observed in both sexes at 1,000 mg/kg bw/day.

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

Description (incidence and severity)
Low value of food consumption was observed in both sexes at 1,000 mg/kg bw/day.

Food efficiency
not examined

Water consumption and compound intake (if drinking water study)
not examined

Ophthalmological findings
not examined

Haematological findings
not examined

Clinical biochemistry findings
not examined

Urinalysis findings
not examined

Behaviour (functional findings)
not examined

Organ weight findings including organ / body weight ratios
no effects observed

Gross pathological findings
effects observed, treatment-related

Description (incidence and severity)
see tables.

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

Description (incidence and severity)
see tables.

Histopathological findings: neoplastic
not examined

Effect levels

Dose descriptor
NOAEL

Effect level

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

Based on
test mat.

Sex
male/female

Basis for effect level
other: Nine males and seven females died with tremors and decreased locomotor activity at 1,000 mg/kg bw/day by day 9 of administration.

Target system / organ toxicity

Key result
false

Critical effects observed
not specified

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/PDF104 -88 -1c.pdf

Applicant's summary and conclusion

Conclusions
In this study, NOAEL for repeated-dose toxicity was determined to be 200 mg/kg bw/day in male and female rats.

Executive summary

A reproduction/developmental toxicity screening test was performed according to OECD TG 421. Male and female rats (12 animals/sex/dose) were administered 4-chlorobenzaldehyde at 0, 40, 200, and 1,000 mg/kg bw/day. Males were dosed for 42 days, including a 14 day pre-mating and mating periods. Females were dosed for 42–45 days, including a 14-day pre-mating, mating, and gestation periods and the time until day 4 of lactation. Nine males and seven females died with tremors and decreased locomotor activity at 1,000 mg/kg bw/day by day 9 of administration. In this study, NOAEL for repeated-dose toxicity was determined to be 200 mg/kg bw/day in male and female rats.

Genetic toxicity in vitro

ENDPOINT_STUDY_RECORD: Genetic toxicity in vitro.001

UUID: IUC5-6657ee02-5cbb-4ca8-9b60-b74d46361195
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T12:03:06.000+09:00
Remarks:

Administrative data

Endpoint
in vitro gene mutation study in bacteria Type of genotoxicity: gene mutation

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
other: OECD Test Guideline study under GLP condition

Data source

Reference

Reverse Mutation Test of 4-chlorobenzaldehyde on Bacteria. / MHLW, Japan / study report

Data access
data published

Materials and methods

Test guideline

Qualifier
according to

Guideline
JAPAN: Guidelines for Screening Mutagenicity Testing Of Chemicals

Qualifier
according to

Guideline
OECD Guideline 471 (Bacterial Reverse Mutation Assay)
in vitro gene mutation study in bacteria

GLP compliance
yes

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

Test material

Test material information
4-chlorobenzaldehyde / 104-88-1 / 203-247-4

Method

Species / strain

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

Metabolic activation
with and without

Metabolic activation system
rat liver, induced by phenobarbital and 5,6-benzoflavone

Species / strain
E. coli WP2 uvr A
bacteria

Metabolic activation
with and without

Metabolic activation system
rat liver, induced by phenobarbital and 5,6-benzoflavone

Test concentrations with justification for top dose
-S9 mix and + S9 mix: 15.6, 31.3, 62.5, 125, 250, 500 µg/plate (all strains)

Vehicle
- Vehicle(s)/solvent(s) used: DMSO

Controls

Negative controls
no

Solvent controls
yes

True negative controls
other: tests without all strains, and with vehicle, S9 mix or the highest dose

Positive controls
yes

Positive control substance
other: -S9 mix: 2-(2-Furyl)-3-(5-nitro-2-furyl) acrylamide (AF2:TA 100, TA98 & WP2 uvrA), sodium azide (SA:TA1535) and 9-aminoacridine hydrochloride (9AA:TA1537). +S9 mix: 2-aminoanthracene (2AA:all strains).

Details on test system and conditions
RANGE-FINDING/SCREENING STUDIES:
Concentration: 20-5000 µg/plate
Cytotoxic conc.: Yes, >500 µg/plate
Precipitate: No.
METHOD OF APPLICATION: Preincubation
DURATION
- Preincubation period: 20 min at 37 °C
- Exposure duration:48-49 hrs
NUMBER OF PLATES: 3
NUMBER OF REPLICATIONS: 2
DETERMINATION OF CYTOTOXICITY
- Method: other: growth inhibition

Evaluation criteria
In any strain(s) tested with or without S9 mix, when the mean number of revertant colonies per plate increased twice more than that of the negative control and when the increase was shown to be dose-related and reproducible, the chemical was judged mutagenic.

Statistics
No.

Results and discussion

Test results

Key result
false

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

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity
yes -S9 mix: 500 µg/plate, +S9 mix: >250 µg/plate

Vehicle controls valid
yes

Negative controls valid
yes

Positive controls valid
yes

Remarks on result
other: all strains/cell types tested Migrated from field 'Test system'.

Key result
false

Species / strain
E. coli WP2 uvr A
bacteria

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity
yes -S9 mix: 500 µg/plate, +S9 mix: >250 µg/plate

Vehicle controls valid
yes

Negative controls valid
yes

Positive controls valid
yes

Remarks on result
other: all strains/cell types tested Migrated from field 'Test system'.

Additional information on results
Contamination with any other bacterias was not found.

Any other information on results incl. tables

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

http://dra4.nihs.go.jp/mhlw_data/home/pdf/
PDF104 -88 -1e.pdf

Applicant's summary and conclusion

Conclusions
Interpretation of results (migrated information):
negative

Executive summary

In a bacterial reverse mutation assay using S. typhimurium TA100, TA1535, TA98, and TA1537 andE. coliWP2uvrA (OECD TG 471), 4-chlorobenzaldehyde was negative with or without metabolic activation.

ENDPOINT_STUDY_RECORD: Genetic toxicity in vitro.002

UUID: IUC5-df6301ac-67fc-4017-b622-6ee93cc170fe
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T12:09:01.000+09:00
Remarks:

Administrative data

Endpoint
in vitro cytogenicity / chromosome aberration study in mammalian cells Type of genotoxicity: chromos ome aberration

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
other: OECD Test Guideline study under GLP condition

Data source

Reference

In Vitro Chromosomal Aberration Test of 4-chlorobenzaldehyde on Cultured Chinese Hamster Cells. / MHLW, Japan / study report

Data access
data published

Materials and methods

Test guideline

Qualifier
according to

Guideline
OECD Guideline 473 (In Vitro Mammalian Chromosome Aberration Test)
in vitro cytogenicity / chromosome aberration study in mammalian cells

Deviations
no

Qualifier
according to

Guideline
JAPAN: Guidelines for Screening Mutagenicity Testing Of Chemicals

Deviations
no

GLP compliance
yes

Type of assay
in vitro mammalian chromosome aberration test
chromosome aberration

Test material

Test material information
4-chlorobenzaldehyde / 104-88-1 / 203-247-4

Method

Target gene
Chromosome

Species / strain

Species / strain
other: Chinese hamster lung(CHL/IU) cells

Metabolic activation
with and without

Metabolic activation system
rat liver, induced by phenobarbital and 5,6-benzoflavone

Test concentrations with justification for top dose
-S9 mix (short-term treatment): 0, 21.9, 43.8, 87.5, 175, 263, 350 ug/mL
-S9 mix (short-term treatment, confirmatory test 1): 0, 43.8, 87.5, 175, 219, 263, 307, 350 ug/mL
-S9 mix (short-term treatment, confirmatory test 2): 0, 87.5, 175, 219, 263, 307, 350 ug/mL
+S9 mix (short-term treatment): 0, 87.5, 175, 350, 700, 1050, 1400 ug/mL
+S9 mix (short-term treatment, confirmatory test 1): 0, 87.5, 175, 350, 467, 583, 700 ug/mL
-S9 mix (continuous treatment, 24 h): 0, 5.47, 10.9, 21.9, 43.8, 87.5, 131, 175 ug/mL
-S9 mix (continuous treatment, 24 h, confirmatory test 1): 0, 21.9, 43.8, 87.5, 109, 131 ug/mL
-S9 mix (continuous treatment, 24 h, confirmatory test 2): 0, 21.9, 43.8, 65.7, 87.5, 109, 131 ug/mL

Vehicle
- Vehicle(s)/solvent(s) used: DMSO

Controls

Negative controls
no

Solvent controls
yes

True negative controls
no

Positive controls
yes

Positive control substance
benzo(a)pyrene
cyclophosphamide
mitomycin C

Remarks
mitomycin C (without S9 mix), benzo[a]pyrene or 3,4-benzopyrene (with S9 mix)

Details on test system and conditions
METHOD OF APPLICATION: Exposure duration: [continuous treatment]: 24 hrs [short-term treatm ent]:6 hrs + 18 hr
SPINDLE INHIBITOR: Colcemid
NUMBER OF REPLICATIONS: 2-3
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 reproducible.

Statistics
not used.

Results and discussion

Test results

Key result
false

Species / strain
other: Chinese hamster lung (CHL/IU) cells

Metabolic activation
with

Genotoxicity
positive D20: 0.65 mg/mL (main test), 0.57 mg/mL (confirmatory test)

Cytotoxicity
yes >50% cell growth inhibition: >700 ug/mL (short, main), >700 ug/mL (short, confirmatory test)

Vehicle controls valid
yes

Negative controls valid
not examined

Positive controls valid
yes

Key result
false

Species / strain
other: Chinese hamster lung (CHL/IU) cells

Metabolic activation
without

Genotoxicity
positive D20: 0.24 mg/mL (main test), 0.26 mg/mL (confirmatory-2)

Cytotoxicity
yes >50% cell growth inhibition: >350 ug/mL (short, main), >131 ug/mL (24h, main), >263 ug/mL (short, confirmatory-1), >131 ug/mL (24h, confirmatory-1), >307 ug/mL (short, confirmatory-2), >109 ug/mL (24h, confirmatory-2)

Vehicle controls valid
yes

Negative controls valid
not examined

Positive controls valid
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/PDF104 -88 -1f.pdf

Applicant's summary and conclusion

Executive summary

An in vitro chromosomal aberration test using CHL/IU cells (OECD TG 473) showed positive.

Toxicity to reproduction

ENDPOINT_STUDY_RECORD: Toxicity to reproduction.001

UUID: IUC5-24c0bbaa-17a7-4f00-b6e7-24491d5a34b4
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T12:13:20.000+09:00
Remarks:

Administrative data

Endpoint
screening for reproductive / developmental toxicity based on test type (migrated information)

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
other: OECD Test Guideline study under GLP condition

Cross-reference

Reason / purpose
reference to same study

Remarks
7.5.1 Repeated dose toxicity: oral.002

Data source

Reference

A reproduction/developmental toxicity screening test in rats treated orally with 4-chlorobenzaldehyd... / MHLW, Japan / study report

Data access
data published

Materials and methods

Test guideline

Qualifier
according to

Guideline
other: OECD TG 421: Reproduction/developmental toxicity screening test

Deviations
no

GLP compliance
yes

Limit test
no

Test material

Test material information
4-chlorobenzaldehyde / 104-88-1 / 203-247-4

Test animals

Species
rat

Strain
other: Crl:CD(SD)

Sex
male/female

Details on test animals and environmental conditions
TEST ANIMALS
- Source: Charles River Laboratories Japan, Inc. Tsukuba
- Age at study initiation: 10 weeks
- Weight at study initiation: Males: 389-449 g; Females: 234-271 g
- Housing: Steel wire-mesh cage (250 mm x 350 mm x 200 mm)
- Diet: ad libitum
- Water: ad libitum
- Acclimation period: 14 days

ENVIRONMENTAL CONDITIONS
- Temperature (°C): 20-25
- Humidity (%): 41-69
- Air changes: 10-15 times / hr
- Photoperiod: 12 hrs dark / 12 hrs light (07:00-19:00)

Administration / exposure

Route of administration
oral: gavage

Vehicle
corn oil

Details on mating procedure
- M/F ratio per cage:1:1
- Length of cohabitation:up to 14 days
- Proof of pregnancy: [vaginal plug / sperm in vaginal smear] referred to as [day 0] of pregnancy

Analytical verification of doses or concentrations
yes

Duration of treatment / exposure
(P) Males: 42 days including 14 days pre-mating and mating periods, and thereafter 14 days (P) Females: 42-45 days including 14 days pre-mating, mating and gestation periods, and the days until day 4 of lactation

Frequency of treatment
Once/day, 7days/week

Doses / concentrations

Remarks
Doses / Concentrations:
0 (vehicle), 40, 200, and 1000 mg/kg bw/day
Basis:
actual ingested

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

Control animals
yes, concurrent vehicle

Examinations

Parental animals: Observations and examinations
CAGE SIDE OBSERVATIONS: Yes
- Time schedule:
Males and females: 3 times/day

BODY WEIGHT: Yes
- Time schedule for examinations:
Males: Days 1, 4, 8, 11, 15, 22, 25, 29, 32, 36, 39, 42, and the day of necropsy
Females: Twice a week during the precopulation period (days 1, 4, 8, 11, and 15); gestation days 0, 4, 7, 11, 14, 17, and 20; lactation days 0 and 4; and the day of necropsy

FOOD CONSUMPTION: Yes
Males: Days 1, 4, 8, 11, 15, 32, 36, 39, and 42 in dosing period
Females: Days 1, 4, 8, 11, and 15; gestation days 1, 4, 7, 11, 14, 17, and 20; lactation days 2 and 4

OTHER: Females: Numbers of corpus luteum and implantation site on the day of necropsy

Estrous cyclicity (parental animals)
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)
Parameters examined in P male parental generations: testes weight, epididymides weight

Litter observations
PARAMETERS EXAMINED:The following parameters were examined in F1 offspring [number and sex of pups, stillbirths, live births, postnatal mortality, presence of gross anomalies, and weight].
GROSS EXAMINATION OF DEAD PUPS: Yes, for external and internal abnormalities.

Postmortem examinations (parental animals)
SACRIFICE:
Male animals: Rats were euthanized by exsanguination under ether anesthesia on the day after the last administration.
Maternal animals: Rats were euthanized by exsanguination under ether anesthesia on day 4 of lac tation.

GROSS PATHOLOGY: Yes (see tables)
HISTOPATHOLOGY: Yes (epididymis, prostate, seminal vesicle, testis, ovary, uterus, vagina, and gross abnormal sites)
ORGAN WEIGHTS, Yes: Testes and epididymis

Postmortem examinations (offspring)
GROSS NECROPSY
- Gross necropsy consisted of external and internal examinations including the cervical, thoracic, and abdominal viscera.

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).
Especially,
Implantation index, Stillborn index, Liveborn index, External abnormalities, Viability index: 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
Each parameter was determined by the following equations:
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
Sex ratio = No. of liveborn male pups/(No. of liveborn male pups + No. of liveborn female pups)

Offspring viability indices
Viability index (%) = (No. of surviving pus on day 4 after birth/No. of liveborn pups on day 0 after birth) × 100

Results and discussion

Results: P0 (first parental animals)

General toxicity (P0)

Clinical signs
effects observed, treatment-related

Description (incidence and severity)
see 7.5.1 Repeated dose toxicity: oral.002

Body weight and weight changes
effects observed, treatment-related

Description (incidence and severity)
see 7.5.1 Repeated dose toxicity: oral.002

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

Description (incidence and severity)
see 7.5.1 Repeated dose toxicity: oral.002

Organ weight findings including organ / body weight ratios
no effects observed

Description (incidence and severity)
on reproductive organs

Gross pathological findings
no effects observed

Description (incidence and severity)
on reproductive organs

Histopathological findings: non-neoplastic
no effects observed

Description (incidence and severity)
on reproductive organs

Reproductive function / performance (P0)

Reproductive function: estrous cycle
no effects observed

Reproductive function: sperm measures
not examined

Reproductive performance
no effects observed

Description (incidence and severity)
on reproductive organs

Effect levels (P0)

Dose descriptor
NOAEL

Effect level

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

Sex
male/female

Basis for effect level
other: Nine males and seven females died with tremors and decreased locomotor activity at 1,000 mg/kg bw/day by day 9 of administration.

Results: F1 generation

General toxicity (F1)

Clinical signs
no effects observed

Mortality / viability
no mortality observed

Body weight and weight changes
no effects observed

Sexual maturation
not examined

Organ weight findings including organ / body weight ratios
not examined

Gross pathological findings
no effects observed

Histopathological findings
not examined

Effect levels (F1)

Dose descriptor
NOAEL

Generation
F1

Effect level

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

Sex
male/female

Basis for effect level
other: Administration of 4-chlorobenzaldehyde at 1,000 mg/kg bw/day was halted because of the frequent deaths in male and female rats.

Overall reproductive toxicity

Key result
false

Reproductive effects observed
not specified

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/PDF104 -88 -1c.pdf

Applicant's summary and conclusion

Conclusions
NOAEL for the rat reproductive/developmental toxicity of 4-chlorobenzaldehyde was determined to be 200 mg/kg bw/day.

Executive summary

In the reproduction/developmental toxicity screening test (0, 40, 200, and 1,000 mg/kg bw/day) (OECD TG 421), administration of 4-chlorobenzaldehyde at 1,000 mg/kg bw/day was halted because of the frequent deaths in male and female rats. No effects of this substance on reproductive and developmental parameters were observed at 200 mg/kg bw/day. NOAEL for the rat reproductive/developmental toxicity of 4-chlorobenzaldehyde was determined to be 200 mg/kg bw/day.

References

REFERENCE_SUBSTANCE: 4-chlor obenzaldehyde

UUID: ECB5-0baf6234-8c2b-4e38-9592-5f8028824cc8
Dossier UUID:
Author: SuperUser
Date: 2016-12-21T15:12:20.000+09:00
Remarks:

General information

Reference substance name
4-chlorobenzaldehyde

Inventory

Inventory name
4-chlorobenzaldehyde

Inventory
EC

Inventory number
203-247-4

CAS number
104-88-1

Molecular formula
C7H5ClO

Description

Reference substance information

IUPAC name
4-chlorobenzaldehyde

Synonyms

Identity 4-chlorobenzaldehyde
Identity Benzaldehyde, 4-chloro-

CAS information

CAS number
104-88-1

Related substances

Group / category information
USEPA Category: Aldehydes;Neutral Organics

Molecular and structural information

Molecular formula
C7H5ClO

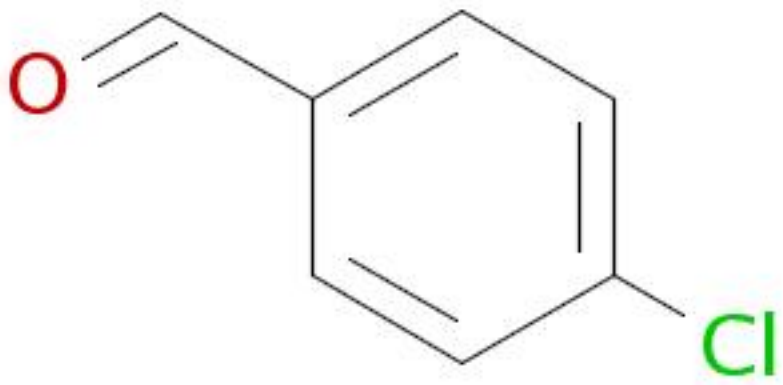
Molecular weight

140.567

SMILES notation
Clc1ccc(C=O)cc1

InChI
InChI=1/C7H5ClO/c8-7-3-1-6(5-9)2-4-7/h1-5H

Structural formula



TEST_MATERIAL_INFORMATION: 4-chlorobenzaldehyde / 104-88-1 / 203-247-4

UUID: 3d2fbea2-6dde-3021-a76a-0ed177181828
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T11:42:25.000+09:00
Remarks:

Name
4-chlorobenzaldehyde / 104-88-1 / 203-247-4

Composition

Type
Constituent

Reference substance
4-chlorobenzaldehyde / 4-chlorobenzaldehyde / 104-88-1 / 203-247-4

EC number	EC name
203-247-4	EC Inventory
CAS number	**CAS name**
104-88-1	
IUPAC name	
4-chlorobenzaldehyde	

Other characteristics

Details on test material
- Name of test material (as cited in study report): 4-Chlorobenzaldehyde
- Analytical purity: 99.06%
- Lot No.: F7049
- Storage condition of test material: at a cold (temperature 1-10 ℃) and dark place, with airtight stopper.
- Stability under test conditions: The stability of test material was identified by analysis of the remainder.

TEST_MATERIAL_INFORMATION: 4-chlorobenzaldehyde / 104-88-1 / 203-247-4

UUID: 6f79d44d-3e27-35b9-9b7c-eae8986a812e
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T12:13:20.000+09:00
Remarks:

Name
4-chlorobenzaldehyde / 104-88-1 / 203-247-4

Composition

Type
Constituent

Reference substance
4-chlorobenzaldehyde / 4-chlorobenzaldehyde / 104-88-1 / 203-247-4

EC number	EC name
203-247-4	EC Inventory
CAS number	**CAS name**
104-88-1	
IUPAC name	
4-chlorobenzaldehyde	

Other characteristics

Details on test material
- Name of test material (as cited in study report): 4-chlorobenzaldehyde
- Purity: 99.8%
- Lot/batch No.: QJ5LK
- Stability under test conditions: Stable
- Storage condition of test material: a cool (2-8 °C) and dark place (in a refrigerator), with an airtight s topper
- Dosing solution storage condition: under room temperature (19-23 °C) in a brown glass bottle
- Other: The dosing solution was used within 7 days of preparation.

TEST_MATERIAL_INFORMATION: 4-chlorobenzaldehyde / 104-88-1 / 203-247-4

UUID: 45ad02fc-c5d2-3583-9271-63c80c9ae2e2
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T12:03:06.000+09:00
Remarks:

Name
4-chlorobenzaldehyde / 104-88-1 / 203-247-4

Composition

Type
Constituent

Reference substance
4-chlorobenzaldehyde / 4-chlorobenzaldehyde / 104-88-1 / 203-247-4

EC number	EC name
203-247-4	EC Inventory
CAS number	**CAS name**
104-88-1	
IUPAC name	
4-chlorobenzaldehyde	

Other characteristics

Details on test material
- Name of test material (as cited in study report): 4-chlorobenzaldehyde
- Purity: 99.06%
- Lot/batch No.: F7049
- Storage condition of test material: in a hermetically sealed and light-resistant container at cool (2-9 ℃) place
- Stability under test conditions: The stability of test material was identified by analysis of the remainder.

TEST_MATERIAL_INFORMATION: 4-chlorobenzaldehyde / 104-88-1 / 203-247-4

UUID: 73144eba-5d92-3a50-bce8-9ff650585cd4
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T12:09:01.000+09:00
Remarks:

Name
4-chlorobenzaldehyde / 104-88-1 / 203-247-4

Composition

Type
Constituent

Reference substance
4-chlorobenzaldehyde / 4-chlorobenzaldehyde / 104-88-1 / 203-247-4

EC number	EC name
203-247-4	EC Inventory
CAS number	**CAS name**
104-88-1	
IUPAC name	
4-chlorobenzaldehyde	

Other characteristics

Details on test material
- Name of test material (as cited in study report): 4-chlorobenzaldehyde
- Analytical purity: 99.06%
- Lot/batch No.: F7049
- Storage condition of test material: in a hermetically sealed and light-resistant container at cool (2-9 ℃) place
- Stability under test conditions: The stability of test material was identified by analysis of the remainder.

LITERATURE: A reproduction/developmental toxicity screening test in rats treated orally with 4-chlorobenzaldehyde

UUID: 7a906d06-e2b2-33e0-8940-38ed3aee35a3
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T11:45:20.000+09:00
Remarks:

General information

Reference Type
study report

Title
A reproduction/developmental toxicity screening test in rats treated orally with 4-chlorobenzaldehyde

Author
MHLW Japan

Year
2011

Bibliographic source
available in the web of Japan Existing Chemical Data Base (JECDB) at http://dra4.nihs.go.jp/mhlw_data/jsp/SearchPageENG.jsp

Testing facility
BoZo Research Center

LITERATURE: A reproduction/developmental toxicity screening test in rats treated orally with 4-chlorobenzaldehyde

UUID: 22272062-d1a6-3a5d-b062-26dd76552a05
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T12:13:20.000+09:00
Remarks:

General information

Reference Type
study report

Title
A reproduction/developmental toxicity screening test in rats treated orally with 4-chlorobenzaldehyde

Author
MHLW, Japan

Year
2009

Bibliographic source
available in the web of Japan Existing Chemical Data Base (JECDB) at http://dra4.nihs.go.jp/mhlw_data/jsp/SearchPageENG.jsp

Testing facility
BoZo Research Center

LITERATURE: In Vitro Chromosomal Aber ration Test of 4-chlorobenzaldehyde on Cultured Chinese Hamster Cells.

UUID: 6b56bfc3-62e7-3148-942a-7fe72e1f0f90
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T12:09:01.000+09:00
Remarks:

General information

Reference Type
study report

Title
In Vitro Chromosomal Aberration Test of 4-chlorobenzaldehyde on Cultured Chinese Hamster Cells.

Author
MHLW, Japan

Year
2011

Bibliographic source
Japan Existing Chemical Data Base (JECDB)

Testing facility
Safety Research Institute for Chemical Compounds Co., Ltd.

LEGAL_ENTITY: National Institute of Health Sciences

UUID: IUC4-b036ff75-0f3c-323b-b200-ed5f46cf5101
Dossier UUID:
Author: SuperUser
Date: 2011-06-23T11:55:01.000+09:00
Remarks:

General information

Legal entity name
National Institute of Health Sciences

Identifiers

Other IT system identifiers

IT system
LEO

ID
10767

IT system
IUCLID4

ID
16558402024DIV750

Contact information

Contact address

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158-8501

Town
Tokyo

Country
Japan

Contact persons

Person
Hirose, Akihiko; National Institute of Health Sciences

Last name
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First name
Akihiko

Organisation
National Institute of Health Sciences

Department
Division of Risk Assessment

Title
Dr.

Address 1
1-18-1 Kamiyoga

Address 2
Setagaya-ku

Postal code
158-8501

Town
Tokyo

Country
Japan

LITERATURE: Reverse Mutation Test of 4-chlorobenzaldehyde on Bacteria.

UUID: 73ff8829-35c8-3d27-9841-753cf862a37e
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T12:03:06.000+09:00
Remarks:

General information

Reference Type
study report

Title
Reverse Mutation Test of 4-chlorobenzaldehyde on Bacteria.

Author
MHLW, Japan

Year
2012

Bibliographic source
Japan Existing Chemical Data Base (JECDB)

Testing facility
Safety Research Institute for Chemical Compounds Co., Ltd.

LITERATURE: Twenty-eight-day Repeat Dose Oral Toxicity Test of 4-Chlorobenzaldehyde in Rats

UUID: a17c23ea-ac60-3e55-a207-d084befee301
Dossier UUID:
Author: SuperUser
Date: 2017-01-17T11:42:25.000+09:00
Remarks:

General information

Reference Type
publication

Title
Twenty-eight-day Repeat Dose Oral Toxicity Test of 4-Chlorobenzaldehyde in Rats

Author
MHLW

Year
2011

Bibliographic source
available in the web of Japan Existing Chemical Data Base (JECDB) at http://dra4.nihs.go.jp/mhlw_data/jsp/SearchPageENG.jsp

Testing facility
Safety Research Institute for Chemical Compounds Co., Ltd.