Name: 2-Chlorobenzoyl chloride / 2-chlorobenzoyl chloride / 609-65-4

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

Printing date: 2019-09-03T16:02:52.486+09:00

Table of Contents

2-Chlorobenzoyl chloride

CORE

General information

Identification

SUBSTANCE: 2-Chlorobenzoyl chloride

UUID: 4b13eca6-c0a4-400d-b113-88278d1a3219
Dossier UUID:
Author: SuperUser
Date: 2019-03-27T09:57:48.275+09:00
Remarks:

Substance name
2-Chlorobenzoyl chloride

Legal entity
National Institute of Health Sciences / Kawasaki / Japan

Identification of substance

Reference substance
2-chlorobenzoyl chloride / 2-chlorobenzoyl chloride / 609-65-4 / 210-194-0

EC number	EC name
210-194-0	EC Inventory
CAS number	**CAS name**
609-65-4	
IUPAC name	
2-chlorobenzoyl chloride	

Role in the supply chain

Manufacturer
false

Importer
false

Only representative
false

Downstream user
false

OECD

Health Effects

Acute toxicity: oral

ENDPOINT_STUDY_RECORD: Acute toxicity: oral.001

UUID: c812f88c-ec7f-4d62-9d47-96f16e5249ae
Dossier UUID:
Author: SuperUser
Date: 2019-02-15T15:52:53.694+09:00
Remarks:

Administrative data

Endpoint
acute toxicity: oral

Type of information
experimental study

Adequacy of study
key study

Robust study summary
true

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

Single Dose Oral Toxicity Test of 2-Chlorobenzoyl chloride / MHLW (Ministry of Health, Labour and Welfare), Japan / study report

Data access
data published

Materials and methods

Test guideline

Qualifier
according to

Guideline
OECD Guideline 423 (Acute Oral toxicity - Acute Toxic Class Method)

GLP compliance
yes

Test type
acute toxic class method

Limit test
yes

Test material

Specific details on test material used for the study
- Lot No.: GK01 (Tokyo Chemical Industry Co., Ltd.)
- Purity: 99.2%
- Solubility: soluble in corn oil
- Physical state: Colorless liquid
- Storage condition of test material: in cool (2-10 degree C) and dark place

Test animals

Species
rat
common species

Strain
Crj: CD(SD)
rat

Sex
female

Details on test animals and environmental conditions
TEST ANIMALS
- Source: Charles River Japan Inc.
- Age at the time of purchase: 7 or 8 weeks old
- Weight at dosing: 184-204 g
– Used animal number: A total of 12 females (3 animals/step)
- Housing: one animal/cage
- Diet (e.g. ad libitum): Ad libitum
- Water (e.g. ad libitum): Ad libitum
- Acclimation period: 5 days.
ENVIRONMENTAL CONDITIONS
- Temperature (°C): 22±3°C (21-24 °C)
- Humidity (%): 50±20% (47-69%)
- Ventilation (per hr): 10-15 times
- Photoperiod (hrs light / hrs dark): 12/12

Administration / exposure

Route of administration
oral: gavage

Vehicle
corn oil

Details on oral exposure
MAXIMUM DOSE VOLUME APPLIED:5 ml/kg b.w.

Doses
2000 mg/kg bw (1st and 2nd steps)

No. of animals per sex per dose
3 females/dose

Control animals
no

Details on study design
- Duration of observation period following administration: 14 days
- Frequency of observations: for one hour after dosing, and 2 and 4h after dosing (1st step). For one hour after dosing, and 2, 4, and 6h after dosing (2nd step). Thereafter, twice a day on Days 2 to 13, and once a day on Day 14.
- Frequency of weighing: One day before dosing, before administration, and on Days 1, 3, 5, 7, 10 an d 14.
- Necropsy of survivors performed: Yes

Statistics
not used

Results and discussion

Effect levels

Key result
true

Sex
female

Dose descriptor
LD50

Effect level

>	2000	mg/kg bw

Based on
act. ingr.

Mortality
No deaths were observed in the first and second dosing groups.

Clinical signs
Diarrhea, mucous feces, soil of perianal fur and soil of perigenital fur were observed sporadically.

Body weight
There were no changes related to the test substance.

Gross pathology
There were no changes related to the test substance.

Applicant's summary and conclusion

Conclusions

The acute oral LD50 of 2-Chlorobenzoyl chloride was >2000 mg/kg bw in female rats based on the study conducted according to the OECD TG 423.

Repeated dose toxicity: oral

ENDPOINT_STUDY_RECORD: Repeated dose toxicity: oral.001

UUID: 4b62f0bf-a629-474c-b38b-5cdd85e8a20c
Dossier UUID:
Author: SuperUser
Date: 2019-03-27T09:57:59.343+09:00
Remarks:

Administrative data

Endpoint
repeated dose toxicity: oral, other

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
reference to same study

Related information
OECD / Toxicity to reproduction / Toxicity to reproduction.001 / 2-Chlorobenzoyl chloride / 2-chlorobenzoyl chloride / 609-65-4

Data source

Reference

A combined repeated dose/reproductive developmental toxicity study of 2-chlorobenzoyl chloride by or... / Ministry of Health, Labor and Welfare, Japan / study report

Data access
data published

Materials and methods

Test guideline

Qualifier
according to

Guideline
OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)

Deviations
no

GLP compliance
yes

Limit test
no

Test material

Specific details on test material used for the study
- Name of test material (as cited in study report): 2-chlorobenzoyl chloride
- Analytical purity: 99.2%
- Storage condition of test material: at a cold (temperature 2-10°C) and dark place, with airtight stopper.
- Stability under test conditions: The stability of test material was identified by analysis of the remainder.

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., Atsugi Breeding Center.
- Age at study initiation: 10 weeks old
- Weight at study initiation: Male: 398.6 g (366 -432 g), Female: 257.2 g (235-283 g)
- Housing: Animals were housed individually, except for during the acclimation (one or two animals by sex), mating (one male and one female) and lactation periods (one litter), in metallic bracket-type cages with wire mesh floors (300Wx 410D x 200H mm). From gestation day 17 to lactation day 4, individual dams and litters were reared on bedding.
- Diet: Solid feed (CRF-1: Oriental Yeast Co., ltd.) was given ad libitum.
- Water: Tap water was given ad libitum.
- Acclimation period: 14 days
ENVIRONMENTAL CONDITIONS
- Temperature (°C): 22±3 (actual temperature: 21-25°C)
- Humidity (%): 50±20% (actual humidity: 44-69%)

- 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

Details on oral exposure
- Amount of vehicle (if gavage): 5 mL/kg
- Dosing volume: 5 mL/kg

Analytical verification of doses or concentrations
yes

Duration of treatment / exposure
(P) Males: 42 days including 14 days pre-mating
(P)Females: 42-49 days including 14 days pre-mating, mating and gestation periods and the days un til day 4 of lactation
Female (no mating, satellite group): 42 days

Frequency of treatment
Once/day, 7 days/week

Doses / concentrations

Dose / conc.	
0	mg/kg bw/day (actual dose received)
Dose / conc.	
40	mg/kg bw/day (actual dose received)
Dose / conc.	
200	mg/kg bw/day (actual dose received)
Dose / conc.	
1000	mg/kg bw/day (actual dose received)

No. of animals per sex per dose
Main group:12 animals/sex/dose
Satellite (Recovery) group: 5 males/dose and 5 females/dose (0 and 1000 mg/kg bw/day)

Control animals
yes, concurrent vehicle

Details on study design
- Dose selection rationale: Based on the results of a 14-day preliminary study, the highest dose of 1000 mg/kg bw/day was selected as an expected obvious toxic dose, and the lowest dose of 40 mg/kg bw/day was selected as an expected no toxic dose. The middle dose levels of 200 mg/kg bw/day were selected.
- Rationale for animal assignment (if not random): Body weight-balanced randomization

[14-day preliminary study]
A 14-day repeated dose oral toxicity test (Crl:CD(SD) rats, doses: 0 (olive oil), 30, 100, 300 or 1000 mg/kg bw/day). Thickening of the forestomach mucosa was observed at 300 mg/kg bw/day or more. At 1000 mg/kg bw/day, decrease in body weight and body weight gain, decrease in food consumption, decrease in urine pH were observed in males, low value of red blood cell count and hemoglobin level were observed in females, high value of triglyceride, increase in liver and kidney weights were observed in both sexes.

Examinations

Observations and examinations performed and frequency
CAGE SIDE OBSERVATIONS: Yes
- Time schedule: 2 times/day (am: before and after administration; pm) during the administration period. 2 times/day (am and pm) during the recovery period.

DETAILED CLINICAL OBSERVATIONS: Yes
- Time schedule: Once before the start of administration, and once every week by the end of the study period.

BODY WEIGHT: Yes
- Time schedule for examinations:
Males were weighed on Day 1, 3, 5, 7, 10, 14, 21, 28, 35, and 42 of administration, and weighed on Day 7 and 14 of recovery.
Female satellite groups were weighted same frequencies to male recovery groups.
Females in the main groups were weighed on Day 1, 3, 5, 7, 10 and 14 of administration and copulated females were weighed on Day 0, 1, 3, 5, 7, 14, 17 and 20 of gestation, and days 0, 1, and 4 of lactation.

FOOD CONSUMPTION AND COMPOUND INTAKE (if feeding study):
- Food consumption: Yes
Measurement of food consumption was conducted on all animals at the following frequencies:
Males in the main and recovery groups; on Day 1, 3, 5, 7, 10, 14, 21, 28, 35, and 42 of administration, and on Day 7 and 14 of recovery.
Female satellite groups were weighted same frequencies to male recovery groups.
Females in the main group; on Day 1, 3, 5, 7, 10, and 14 of administration and copulated females were weighed on Day 1, 3, 5, 7, 10, 14, 17 and 20 of gestation, and days 1 and 4 of lactation.
OPHTHALMOSCOPIC EXAMINATION: No

HAEMATOLOGY: Yes
- Time schedule for collection of blood: At the end of administration period, or at the end of recovery period in both sexes
- Anaesthetic used for blood collection: ether
- Animals fasted: Yes
- How many animals: 5 animals/sex/group
- Parameters examined included RBC, hemoglobin, hematocrit, MCV, MCH, MCHC, platelet, reticulocyte, PT, APTT, WBC and differential WBC.

CLINICAL CHEMISTRY: Yes
- Time schedule for collection of blood: At the end of administration period, or at the end of recovery period in both sexes
- Animals fasted: Yes

- How many animals: 5 animals/sex/group
- Parameters examined included total protein, protein fraction, albumin, A/G ratio, total bilirubin, gluc ose, total cholesterol, triglyceride, AST, ALT, ALP, gamma-GTP, BUN, creatinine, Na, K, Cl, Ca and IP.

URINALYSIS OF MALES: Yes
- Time schedule for collection of urine (male only): On Week 6 (Day 40-41) of administration, and on Week 2 (Day 12-13) of recovery.
- Metabolism cages used for collection of urine: Yes
- How many animals: 5 animals/group
- Parameters examined included color, urine volume, specific gravity, pH, protein, glucose, ketone body, bilirubin, occult blood and urobilinogen.

NEUROBEHAVIOURAL EXAMINATION: Yes
- Time schedule for examinations: On week 6 of the administration period, and on week 2 of the recovery period
- Dose groups that were examined: All dose groups (5 animals/sex/group)
- Battery of functions tested: sensory activity (hearing reaction, eye sight reaction, sense of touch reaction, pain reaction, proprioceptive, righting reflex), grip strength, motor activity

Sacrifice and pathology
GROSS PATHOLOGY: Yes

ORGAN WEIBHT: Yes [brain, thymus, heart, liver, kidney, adrenal gland, spleen, testis, epididymis]

HISTOPATHOLOGY: Yes, [brain, pituitary, spinal cord, thyroid, parathyroid, heart, thymus, trach ea, lung, liver, kidney, adrenal, spleen, esophagus, stomach, pancreas, duodenum, jejunum, ileum, cecum, colon, rectum, eyeball and Harderian gland, sciatic nerve, bone, bone marrow, lymph nodes (mesenteric and mandibular lymph nodes), urinary bladder, testis, seminal vesicle, prostate, epididymis, mammary gland, ovary and uterus.]

Statistics
The data were analyzed for homogeneity of variance by the Bartlett test. If variances were homogeneous, data was analyzed by one-way ANOVA and the Dunnett test, whereas heterogeneous data was analyzed by Kruskal-Wallis test and the Mann-Whitney U test.
For findings two or more grades was observed, data was analyzed by Kruskal-Wallis test and the Mann-Whitney U test. For findings one grade was observed, data was analyzed by a multi-sample chi-square test and a two-sample chi-square test. For the comparison tests with the control group, the significance level was 5%.

Results and discussion

Results of examinations

Clinical signs
effects observed, treatment-related

Mortality
mortality observed, treatment-related

Body weight and weight changes
effects observed, treatment-related

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

Food efficiency
not examined

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

Ophthalmological findings
not examined

Haematological findings
effects observed, treatment-related

Clinical biochemistry findings
effects observed, treatment-related

Urinalysis findings
effects observed, treatment-related

Behaviour (functional findings)
no effects observed

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

Gross pathological findings
effects observed, treatment-related

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

Histopathological findings: neoplastic
not examined

Details on results
CLINICAL SIGNS AND MORTALITY:
Mortality: At 200 mg/kg bw/day, one pregnant female died on GD 22. At 1000 mg/kg bw/day, one non-pregnant female died on day 5 of the administration period, and one pregnant female died on GD23.
Clinical signs: At 200 mg/kg bw/day, transient salivation and soft feces were observed in females. At 1000 mg/kg bw/day, transient salivation, soil of perianal fur, soil of perigenital fur, mucous feces, and soft feces were observed in males and females.

DETAILED CLINICAL OBSERVATIONS, MANIPULATIVE TEST, GRIP STRENGTH TEST AND LO COMOTOR ACTIVITY MEASUREMENT: There were no changes related to the test substance.

BODY WEIGHT:
[At the dosing period]: At 1000 mg/kg bw/day, decrease in body weight and body weight gain were observed in males.
[At the recovery period]: At 1000 mg/kg bw/day, decrease in body weight was observed in males.

FOOD CONSUMPTION:
[At the dosing period]: At 1000 mg/kg bw/day, low value of food consumption was observed in males at day 3.
[At the recovery period]: At 1000 mg/kg bw/day, low value of food consumption was observed in f emales at lactation day 4.
URINALYSIS:
[At the dosing period]: At 1000 mg/kg bw/day, low value of urinary pH was observed in both sexes, and increased urinary volume was observed in males at week 6.

HAEMATOLOGY:
[At the end of dosing period]: At 1000 mg/kg bw/day, increase in MCV and MCH were observed in males.
[At the end of recovery period]: There were no changes related to the test substance in any groups.

CLINICAL CHEMISTRY:
[At the end of dosing period]: At 1000 mg/kg bw/day, high value of A/G ration, increase in albumin fraction ratio, and decrease in beta-globulin fraction ratio were observed in males and females, incr ease in AST, ALT, and decrease in albumin alfa1-globulin ratio, total cholesterol, K, Cl, and IP were observed in males, decrease in BUN and Ca were observed in females.
[At the end of recovery period]: There were no changes related to the test substance in any groups.
ORGAN WEIGHTS:
[At the end of dosing period]: At 1000 mg/kg bw/day, increase in relative weights of the liver and k idney were observed in males and females.
[At the end of recovery period]: There were no changes related to the test substance in any groups.

GROSS PATHOLOGY:
[At the end of dosing period]: At 1000 mg/kg bw/day, thickening of forestomach mucosa and thickenin g in limiting ridge of stomach were observed in males and females.
[At the end of recovery period]: There were no changes related to the test substance in any groups.

HISTOPATHOLOGY: NON-NEOPLASTIC:
[At the end of dosing period]: At 200 mg/kg bw/day, squamous cell hyperplasia of forestomach was observed in males. At 1000 mg/kg bw\/day, squamous cell hyperplasia of forestomach, inflammatory cell infiltration in submucosa of forestomach, squamous cell hyperplasia in limiting ridge of stomach were observed in males and females, and edema in submucosa of forestomach was observed in females. Spermatogenetic examination of the 1,000 mg/kg bw/day group found a decreased number of Sertoli cells at stages IX–XIV.
[At the end of recovery period]: At 1000 mg/kg bw/day, squamous cell hyperplasia of forestomach persisted in 3/5 males and 1/4 female after the end of the recovery period, but the grade had recovered to a slight level.

Effect levels

Key result
true

Dose descriptor
NOAEL

Effect level

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

Based on
test mat.

Sex
male/female

Basis for effect level
clinical signs
At 200 mg/kg bw/day, transient salivation and soft feces were observed in females.
mortality
At 200 mg/kg bw/day, one pregnant female died on GD 22.
histopathology: non-neoplastic
At 200 mg/kg bw/day, squamous cell hyperplasia of forestomach was observed in males.

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/PDF609-65-4d.pdf

Applicant's summary and conclusion

Executive summary

A combined repeated study of oral-dose toxicity including reproduction/developmental toxicity screening was performed in accordance with OECD TG 422. Male and female rats (12 animals/sex/dose) were administered 2-chlorobenzoyl chloride at 0 (vehicle: corn oil), 40, 200, and 1,000 mg/kg bw/day. The males were dosed for 42 days, including a 14-day pre-mating period and a subsequent mating period. The females were dosed up to 49 days, including 14-day pre-mating, mating, and gestation periods, and until lactation day 5. Out of the 12 males dosed at 0 and 1,000 mg/kg bw/day, 5 were treated as a recovery group. Each five additional females at 0 and 1,000 mg/kg bw/day were dosed with 2-chlorobenzoyl chloride for 42 days without mating and examined after a 14-day recovery period.

One pregnant female died on GD 22 and another on GD23, having been administered 200 mg/kg bw/day and 1,000 mg/kg bw/day, respectively. A non-pregnant female also died on day 5 of the administration period. Salivation, soft feces, mucus feces, and/or soiling of the peri-genital or anal fur were observed in both sexes at 200 and 1,000 mg/kg bw/day groups. Decreases in body weight, weight gain, and food consumption were observed in the males of the 1,000 mg/kg bw/day group. Body weight was not affected by chlorobenzoyl chloride treatment in females, but food consumption decreased during the lactation period for the 1,000 mg/kg bw/day group. The relative organ weights of the liver and kidney increased in both sexes in the 1,000 mg/kg bw/day group. After the administration period, (slight to severe) squamous cell hyperplasia of the forestomach was observed at 1,000 mg/kg bw/day for all animals in both sexes, and an increased tendency was observed in males of the 200 mg/kg bw/day group. This change persisted in 3/5 males and 1/4 female after the end of the recovery period, but the grade had recovered to a slight level. Spermatogenetic examination of the 1,000 mg/kg bw/day group found a decreased number of Sertoli cells at stages IX–XIV. After the recovery period, no adverse effects were observed, except in the forestomach. Judging from the changes in general condition and death at 200 mg/kg bw/day, the NOAEL for the repeated-dose toxicity of 2-chlorobenzoyl chloride was determined to be 40 mg/kg bw/day in rats.

Genetic toxicity in vitro

ENDPOINT_STUDY_RECORD: Genetic toxicity in vitro.001

UUID: 1576bd0d-68b9-4e42-a697-34fc006dbe4e
Dossier UUID:
Author: SuperUser
Date: 2019-02-15T17:07:42.965+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
true

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

Reverse Mutation Test of 2-Chlorobenzoyl chloride / Ministry of Health, Labour and Welfare (MHLW), Japan / study report

Data access
data published

Materials and methods

Test guideline

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

Specific details on test material used for the study
- Lot No.: GK01 (Tokyo Chemical Industry Co., Ltd.)
- Purity: 99.2%
- Solubility: soluble in acetone
- Physical state: Colorless liquid
- Storage condition of test material: in cool (2-8 degree C) and dark place

Method

Species / strain

Species / strain
S. typhimurium TA 1535, TA 1537, TA 98, TA 100 and E. coli WP2
bacteria

Metabolic activation
with and without

Metabolic activation system
S9 mix: Rat liver, induced with phenobarbital and 5,6-benzoflavone

Test concentrations with justification for top dose
Dosage of each strain with or without S9
-S9 mix: 0, 78.1, 156, 313, 625, 1250, 2500 and 5000 µg /plate
+S9 mix: 0, 156, 313, 625, 1250, 2500 and 5000 µg /plate

Maximum concentration was established based on the result of the preliminary test at concentration up to 5000 ug/plate. In this test, growth inhibition was observed at 1500 and 5000 µg/plate for all strains with and without S9 mix.

Vehicle
Acetone

Controls

Negative controls
no

Solvent controls
yes

True negative controls
no

Positive controls
yes

Positive control substance
sodium azide

without S9 mix (TA 1535)
other: without S9 mix:2-(2-Furyl)-3-(5-nitro -2-furyl)acrylamide (TA100, TA98, WP2uvrA), without S9 mix: 9-Aminoacridine hydrochloride hydrate(TA1537) with S9 mix: 2-aminoanthracene (all strains)

Details on test system and conditions
METHOD OF APPLICATION: Preincubation
DURATION- Preincubation period: 20 min at 37°C
- Exposure duration:48 hrs
NUMBER OF PLATES: 3
NUMBER OF REPLICATIONS: 2
DETERMINATION OF CYTOTOXICITY- Method: other: growth inhibition

Evaluation criteria
A chemical was judged to be mutagenic when the mean number of revertant colonies per plate increased more than twice that of the negative control and when the dose-related or reproducible increase was observed.

Statistics
not used

Results and discussion

Test results

Key result
true

Species / strain
S. typhimurium TA 1535
bacteria

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity
yes at 1250 µg /plate and higher

Vehicle controls valid
yes

Positive controls valid
yes

Key result
true

Species / strain
S. typhimurium TA 1537
bacteria

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity
yes at 1250 µg /plate and higher

Vehicle controls valid
yes

Positive controls valid
yes

Key result
true

Species / strain
S. typhimurium TA 98
bacteria

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity
yes at 1250 µg /plate and higher

Vehicle controls valid
yes

Positive controls valid
yes

Key result
true

Species / strain
S. typhimurium TA 100
bacteria

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity
yes at 1250 µg /plate and higher

Vehicle controls valid
yes

Positive controls valid
yes

Key result
true

Species / strain
E. coli WP2 uvr A pKM 101
bacteria

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity
yes Precipitation was observed at 1250 µg /plate and higher

Vehicle controls valid
yes

Positive controls valid
yes

Additional information on results
Precipitation was observed at 1250 µg /plate and higher

Applicant's summary and conclusion

Conclusions
With metabolic activation: Negative
Without metabolic activation: Negative

Executive summary

In a bacterial reverse mutation assay using S. typhimuriumTA100, TA1535, TA98, and TA1537, and E. coliWP2uvrA/pKM101 (OECD TG 471), negative results were obtained for 2-chlorobenzoyl chloride with or without metabolic activation.

ENDPOINT_STUDY_RECORD: Genetic toxicity in vitro.002

UUID: 59b92994-7521-40db-9d85-2ff58564c4b5
Dossier UUID:
Author: SuperUser
Date: 2019-02-18T09:27:49.312+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
true

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

In Vitro Chromosomal Aberration Test of 2-Chlorobenzoyl chloride on Cultured Chinese Hamster Cells / MHLW (Ministry of Health, Labour and Welfare), 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

Qualifier
according to

Guideline
JAPAN: Guidelines for Screening Mutagenicity Testing Of Chemicals
genetic toxicity in vitro, other

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
- Lot No.: GK01 (Tokyo Chemical Industry Co., Ltd.)
- Purity: 99.2%
- Solubility: soluble in acetone
- Physical state: Colorless liquid
- Storage condition of test material: in cool (2-8 degree C) and dark place

Method

Species / strain

Species / strain
other:

Details on mammalian cell lines (if applicable)
Chinese hamster lung(CHL/IU) cell

Metabolic activation
with and without

Metabolic activation system
S9 mix: Rat liver, induced with phenobarbital and 5,6- benzoflavone

Test concentrations with justification for top dose
Short-term treatment(+S9 mix): 0, 109, 219, 329, 438, 657, 875 µg/mL
Short-term treatment(-S9 mix): 0, 109, 219, 274, 329, 384, 438 µg/mL
Continuous treatment: 0, 35.5, 55.0, 72.0, 90.0, 91.5, 98.5 µg/mL

Cell-growth inhibition test was conducted up to the limited concentration of 1750 µg/mL (10 mM).
IC50s were determined to be 386 µg/mL (short-term, -S9), 651 µg/mL (short-term, +S9), and 372 µg/mL (continuous treatment).

Vehicle
acetone

Controls

Negative controls
no

Solvent controls
yes

True negative controls
no

Positive controls
yes

Positive control substance
benzo(a)pyrene
(with S9 mix)
mitomycin C
(without S9 mix)

Details on test system and conditions
METHOD OF APPLICATION: Exposure duration: [short-term treatment]:6 h + 18 h, [continuous tr eatment]: 24h
NUMBER OF CELLS EVALUATED: 200 cells /concentration (100 cells/plate x 2)
Plates/test: 2

Evaluation criteria
For the evaluation of the frequencies of structural aberrations and of polyploidy induced, the following criteria were employed. Appearance incidence of cell with chromosomal aberrations: Negative(-): less than 5%, Equivocal(±): 5% or more and less than 10%, Positive(+): 10% or more

Statistics
Not used

Results and discussion

Test results

Key result
true

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

Metabolic activation
with and without

Genotoxicity
negative

Cytotoxicity
yes >50% growth inhibition was observed at 438 µg/mL (short-term treatment, -S9 mix), 657 µg/mL (short-term treatment, +S9 mix), and 438 µg/mL (continuous treatment)

Vehicle controls valid
yes

Positive controls valid
yes

Additional information on results
Precipitation was observed at the beginning and end of treatment for short-term treatment with S9 mi x at 875 µg/mL. Decreases of pH in culture medium were detected at the beginning of treatment at 384 and 438 µg/mL for all treatment groups, and at the end of treatment at 657 µg/mL for short-term

treatment with S9 mix. In the confirmation tests, 2-Chlorobenzoyl chloride did not induce structural aberrations with and without S9 mix. Polyploidy was not observed in any test conditions. Positive and vehicle control groups were valid.

Any other information on results incl. tables

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

http://dra4.nihs.go.jp/mhlw_data/home/pdf/PDF609-65-4f.pdf

Applicant's summary and conclusion

Conclusions
In an in vitro chromosomal aberration test using CHL/IU cells (OECD TG 473), negative results were obtained with or without metabolic activation.

Executive summary

In an in vitro chromosomal aberration test using CHL/IU cells (OECD TG 473), negative results were obtained with or without metabolic activation for 2-Chlorobenzoyl chloride.

Toxicity to reproduction

ENDPOINT_STUDY_RECORD: Toxicity to reproduction.001

UUID: dcd79d36-4b12-4bb1-befa-f7c6696e653b
Dossier UUID:
Author: SuperUser
Date: 2019-03-27T09:57:59.281+09:00
Remarks:

Administrative data

Endpoint
reproductive toxicity, other A combined repeated dose/reproductive developmental toxicity study

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
reference to same study

Related information
OECD / Repeated dose toxicity: oral / Repeated dose toxicity: oral.001 / 2-Chlorobenzoyl chloride / 2-chlorobenzoyl chloride / 609-65-4

Data source

Reference

A combined repeated dose/reproductive developmental toxicity study of 2-chlorobenzoyl chloride by or... / Ministry of Health, Labor and Welfare, Japan / study report

Data access
data published

Materials and methods

Test guideline

Qualifier
according to

Guideline
OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developme ntal Toxicity Screening Test)

Deviations
no

GLP compliance
yes

Limit test
no

Test material

Specific details on test material used for the study
- Name of test material (as cited in study report): 2-chlorobenzoyl chloride
- Analytical purity: 99.2%
- Storage condition of test material: at a cold (temperature 2-10°C) and dark place, with airtight stopp er.
- Stability under test conditions: The stability of test material was identified by analysis of the remainder.

Test animals

Species
rat

Strain
other: Crl:CD(SD)

Sex
male/female

Details on test animals and environmental conditions
TEST ANIMALS
- Source: Charles River Japan, Inc., Atsugi Breeding Center.
- Age at study initiation: 10 weeks old
- Weight at study initiation: Male: 398.6 g (366 -432 g), Female: 257.2 g (235-283 g)
- Housing: Animals were housed individually, except for during the acclimation (one or two animals by sex), mating (one male and one female) and lactation periods (one litter), in metallic bracket-type cages with wire mesh floors (300Wx 410D x 200H mm). From gestation day 17 to lactation day 4, individual dams and litters were reared on bedding.
- Diet: Solid feed (CRF-1: Oriental Yeast Co., ltd.) was given ad libitum.
- Water: Tap water was given ad libitum.
- Acclimation period: 14 days
ENVIRONMENTAL CONDITIONS
- Temperature (°C): 22±3 (actual temperature: 21-25°C)

- Humidity (%): 50±20% (actual humidity: 44-69%)
- 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

Details on exposure
- Amount of vehicle (if gavage): 5 mL/kg
- Dosing volume: 5 mL/kg

Analytical verification of doses or concentrations
yes

Duration of treatment / exposure
(P) Males: 42 days including 14 days pre-mating
(P)Females: 42-49 days including 14 days pre-mating, mating and gestation periods and the days u ntil day 4 of lactation
Female (no mating, satellite group): 42 days

Frequency of treatment
Once/day, 7 days/week

Doses / concentrations

Dose / conc.	
0	mg/kg bw/day (actual dose received)
Dose / conc.	
40	mg/kg bw/day (actual dose received)
Dose / conc.	
200	mg/kg bw/day (actual dose received)
Dose / conc.	
1000	mg/kg bw/day (actual dose received)

No. of animals per sex per dose
Main group:12 animals/sex/dose
Satellite (Recovery) group: 5 males/dose and 5 females/dose (0 and 1000 mg/kg bw/day)

Control animals
yes, concurrent vehicle

Details on study design
- Dose selection rationale: Based on the results of a 14-day preliminary study, the highest dose of 1000 mg/kg bw/day was selected as an expected obvious toxic dose, and the lowest dose of 40 mg/kg bw/day was selected as an expected no toxic dose. The middle dose levels of 200 mg/kg bw/day were selected.
- Rationale for animal assignment (if not random): Body weight-balanced randomization

[14-day preliminary study]
A 14-day repeated dose oral toxicity test (Crl:CD(SD) rats, doses: 0 (olive oil), 30, 100, 300 or 1000 mg/kg bw/day). Thickening of the forestomach mucosa was observed at 300 mg/kg bw/day or more. At 1000 mg/kg bw/day, decrease in body weight and body weight gain, decrease in food consumption, decrease in urine pH were observed in males, low value of red blood cell count and hemoglobin level were observed in females, high value of triglyceride, increase in liver and kidney weights were observed in both sexes.

Examinations

Parental animals: Observations and examinations
CAGE SIDE OBSERVATIONS: Yes
- Time schedule: 2 times/day (am: before and after administration; pm) during the administration period. 2 times/day (am and pm) during the recovery period.

DETAILED CLINICAL OBSERVATIONS: Yes
- Time schedule: Once before the start of administration, and once every week by the end of the study period.

BODY WEIGHT: Yes
- Time schedule for examinations:
Males were weighed on Day 1, 3, 5, 7, 10, 14, 21, 28, 35, and 42 of administration, and weighed on Day 7 and 14 of recovery.
Female satellite groups were weighted same frequencies to male recovery groups.
Females in the main groups were weighed on Day 1, 3, 5, 7, 10 and 14 of administration and copulated females were weighed on Day 0, 1, 3, 5, 7, 14, 17 and 20 of gestation, and days 0, 1, and 4 of lactation.

FOOD CONSUMPTION AND COMPOUND INTAKE (if feeding study):
- Food consumption: Yes
Measurement of food consumption was conducted on all animals at the following frequencies:
Males in the main and recovery groups; on Day 1, 3, 5, 7, 10, 14, 21, 28, 35, and 42 of administration, and on Day 7 and 14 of recovery.
Female satellite groups were weighted same frequencies to male recovery groups.
Females in the main group; on Day 1, 3, 5, 7, 10, and 14 of administration and copulated females were weighed on Day 1, 3, 5, 7, 10, 14, 17 and 20 of gestation, and days 1 and 4 of lactation.
OPHTHALMOSCOPIC EXAMINATION: No

HAEMATOLOGY: Yes
- Time schedule for collection of blood: At the end of administration period, or at the end of recovery period in both sexes
- Anaesthetic used for blood collection: ether
- Animals fasted: Yes
- How many animals: 5 animals/sex/group
- Parameters examined included RBC, hemoglobin, hematocrit, MCV, MCH, MCHC, platelet, reticulocyte, PT, APTT, WBC and differential WBC.

CLINICAL CHEMISTRY: Yes
- Time schedule for collection of blood: At the end of administration period, or at the end of recovery period in both sexes
- Animals fasted: Yes
- How many animals: 5 animals/sex/group
- Parameters examined included total protein, protein fraction, albumin, A/G ratio, total bilirubin, glucose, total cholesterol, triglyceride, AST, ALT, ALP, gamma-GTP, BUN, creatinine, Na, K, Cl, Ca and IP.

URINALYSIS: Yes
- Time schedule for collection of urine: On Week 6 (Day 40-41) of administration, and on Week 2 (Day 12-13) of recovery.
- Metabolism cages used for collection of urine: Yes
- How many animals: 5 animals/group
- Parameters examined included color, urine volume, specific gravity, pH, protein, glucose, ketone body, bilirubin, occult blood and urobilinogen.

NEUROBEHAVIOURAL EXAMINATION: Yes
- Time schedule for examinations: On week 6 of the administration period, and on week 2 of the recovery period
- Dose groups that were examined: All dose groups (5 animals/sex/group)
- Battery of functions tested: sensory activity (hearing reaction, eye sight reaction, sense of touch reaction, pain reaction, proprioceptive, righting reflex), grip strength, motor activity

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.

Sperm parameters (parental animals)
Parameters examined in all P male parental generations: testis weight, epididymis weight, histopathological examinations for testes, epididymides, seminal vesicle including coagulating gland and ventral prostate.
Stages of spermatogenesis examined in male control group and 1000 mg/kg bw/day group.

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, weight gain, physical or behavioral abnormalities.

Postmortem examinations (parental animals)
METHOD OF SACRIFICED: All animals were sacrificed by exsanguination under ether anesthesia.

SACRIFICE: Male animals: On Day 42, Maternal animals: on Day 6 of lactation, and Male recovery and female satellite animals: on next Day 14 of recovery.

GROSS PATHOLOGY: Yes

ORGAN WEIBHT: Yes [brain, thymus, heart, liver, kidney, adrenal gland, spleen, testis, epididymis]

HISTOPATHOLOGY: Yes, [brain, pituitary, spinal cord, thyroid, parathyroid, heart, thymus, trachea, lung, liver, kidney, adrenal, spleen, esophagus, stomach, pancreas, duodenum, jejunum, ileum, cecum, colon, rectum, eyeball and Harderian gland, sciatic nerve, bone, bone marrow, lymph nodes (mesenteric and mandibular lymph nodes), urinary bladder, testis, seminal vesicle, prostate, epididymis, mammary gland, ovary and uterus.]

Postmortem examinations (offspring)
SACRIFICE
- The F1 offspring were sacrificed at 4 days of age.

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

HISTOPATHOLOGY / ORGAN WEIGTHS
- Not examined.

Statistics
The data were analyzed for homogeneity of variance by the Bartlett test. If variances were homogeneous, data was analyzed by one-way ANOVA and the Dunnett test, whereas heterogeneous data was analyzed by Kruskal-Wallis test and the Mann-Whitney U test.
For findings two or more grades was observed, data was analyzed by Kruskal-Wallis test and the Mann-Whitney U test. For findings one grade was observed, data was analyzed by a multi-sample chi-square test and a two-sample chi-square test. For the comparison tests with the control group, the significance level was 5%.

Reproductive indices
Estrous cycle: Mean estrous cycle
Copulation index (%) = (No. of pairs with successful copulation/No. of pairs mated) × 100
Fertility index (%) = (No. of pregnant females/No. of pairs with successful copulation) × 100
Gestation index (%) = (No. of females with live pups/No. of pregnant females) × 100
Implantation index (%) = (No. of implantation sites/No. of corpora lutea) × 100
Delivery index (%) = (No. of pups born/No. of implantation sites) × 100
Live birth index (%) = (No. of live pups on day 0/No. of pups born) × 100
Sex ratio =Total number of male pups/Total number of female pups
Nursing index (%) = (No. of females nursing live pups on lactation day 4/No. of females with live pups delivery) × 100

Offspring viability indices
Viability index (%) = (No. of live pups on day 4/No. of live pups on day 0) × 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

Mortality
mortality observed, treatment-related

Description (incidence)
See 7.5.1

Body weight and weight changes
effects observed, treatment-related

Description (incidence and severity)
See 7.5.1

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

Description (incidence and severity)
See 7.5.1

Food efficiency
not examined

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

Ophthalmological findings
not examined

Haematological findings
effects observed, treatment-related

Description (incidence and severity)
See 7.5.1

Clinical biochemistry findings
effects observed, treatment-related

Description (incidence and severity)
See 7.5.1

Urinalysis findings
effects observed, treatment-related

Description (incidence and severity)
See 7.5.1

Behaviour (functional findings)
no effects observed

Immunological findings
not examined

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

Description (incidence and severity)
See 7.5.1

Gross pathological findings
effects observed, treatment-related

Description (incidence and severity)
See 7.5.1

Neuropathological findings
not examined

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

Description (incidence and severity)
See 7.5.1

Histopathological findings: neoplastic
not examined

Reproductive function / performance (P0)

Reproductive function: estrous cycle
effects observed, treatment-related

Description (incidence and severity)
An increased tendency was found for abnormal estrus cyclicity at 1,000 mg/kg bw/day.

Reproductive function: sperm measures
effects observed, treatment-related

Description (incidence and severity)
Spermatogenetic examination of the 1,000 mg/kg bw/day group found a decreased number of Sertoli cells at stages IX–XIV.

Reproductive performance
effects observed, treatment-related

Description (incidence and severity)
At 200 mg/kg bw/day, one pregnant female died on GD 22. At 1000 mg/kg bw/day, one pregnant female died on GD23.
A decreased tendency was found for the fertility index at 1,000 mg/kg bw/day.

Effect levels (P0)

Key result
true

Dose descriptor
NOAEL

Effect level

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

Based on
test mat.

Sex
male/female

Basis for effect level
reproductive performance
One pregnant female died on GD 22 at 200 mg/kg bw/day.

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)
Low values of body weights of male and female pups were observed on PND 0, 1, and 4 at 1000 mg/kg bw/day.

Gross pathological findings
no effects observed

Effect levels (F1)

Key result
true

Dose descriptor
NOAEL

Generation
F1

Effect level

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

Based on
test mat.

Sex
male/female

Basis for effect level
body weight and weight gain
Low values of body weights of male and female pups were observed on PND 0, 1, and 4 at 1000 mg/kg bw/day.

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/PDF609-65-4d.pdf

Applicant's summary and conclusion

Executive summary

The above-described combination of repeated oral-dose toxicity research and of a reproduction/ developmental toxicity screening test (OECD TG 422), included observations of deaths in each one dam, before or during the delivery at 200 or 1,000 mg/kg bw/day, which was considered to be reproduction toxicity. Further, an increased tendency was found for abnormal estrus cyclicity and a tendency of decrease in the fertility index at 1,000 mg/kg bw/day. The body weights of the male and female pups were lower on PND 0, 1, and 4 at 1,000 mg/kg bw/day. The maternal death at 200 mg/kg bw/day leads to the conclusion that the NOAEL for rat reproduction/developmental toxicity of 2-chlorobenzoyl chloride is 40 mg/kg bw/day.

References

REFERENCE_SUBSTANCE: 2-chlorobenzoyl chloride

UUID: ECB5-221169d3-09a9-42f6-8b52-bdcafa61e7fe
Dossier UUID:
Author: SuperUser
Date: 2007-05-10T18:00:00.000+09:00
Remarks:

General information

Reference substance name
2-chlorobenzoyl chloride

Inventory

Inventory name
2-chlorobenzoyl chloride

Inventory
EC

Inventory number
210-194-0

CAS number
609-65-4

Molecular formula
C7H4Cl2O

Description

Reference substance information

IUPAC name
2-chlorobenzoyl chloride

Synonyms

Identity Benzoyl chloride, 2-chloro-
Identity Benzoyl chloride, 2-chloro-

CAS information

CAS number
609-65-4

Related substances

Group / category information
USEPA Category: Acid Chlorides;Neutral Organics

Molecular and structural information

Molecular formula
C7H4Cl2O

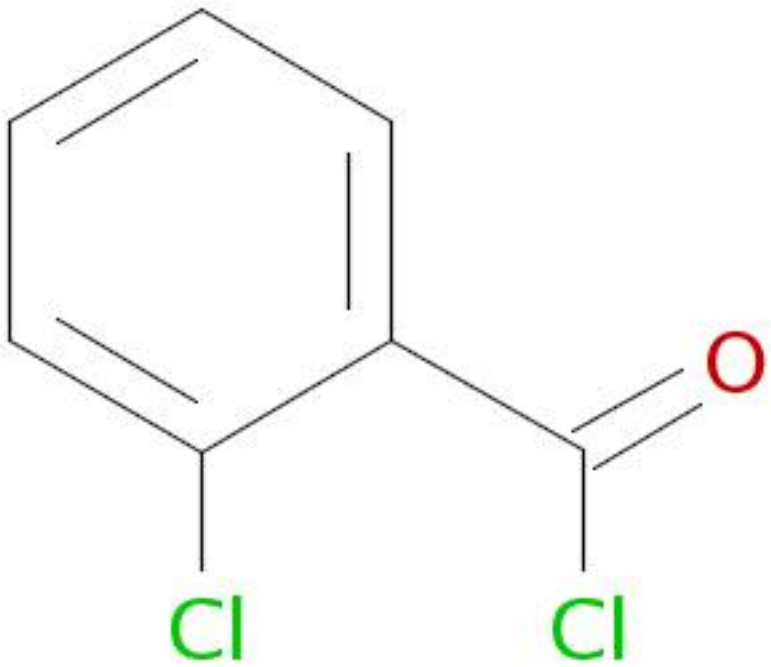
Molecular weight

175.0121

SMILES notation
ClC(=O)c1ccccc1Cl

InChI
InChI=1/C7H4Cl2O/c8-6-4-2-1-3-5(6)7(9)10/h1-4H

Structural formula



LITERATURE: A combined repeated dose/ reproductive developmental toxicity study of 2-chlorobenzoyl chloride by oral adm inistration in rats.

UUID: 552d9d44-22d6-4679-bd2e-2c8f187c02a0
Dossier UUID:
Author: SuperUser
Date: 2019-03-22T10:19:39.000+09:00
Remarks:

General information

Reference Type
study report

Title
A combined repeated dose/reproductive developmental toxicity study of 2-chlorobenzoyl chloride by oral administration in rats.

Author
Ministry of Health, Labor and Welfare, Japan

Bibliographic source
Japan Existing Chemical Data Base (JCDB)

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

Report no.
SR06171

LITERATURE: In Vitro Chromosomal Aberration Test of 2-Chlorobenzoyl chloride on Cultured Chinese Hamster Cells

UUID: 85a292dc-4187-4c03-a1e3-8130c942bfac
Dossier UUID:
Author: SuperUser
Date: 2019-02-15T17:10:51.444+09:00
Remarks:

General information

Reference Type
study report

Title
In Vitro Chromosomal Aberration Test of 2-Chlorobenzoyl chloride on Cultured Chinese Hamster Cells

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

Bibliographic source
http://dra4.nihs.go.jp/mhlw_data/jsp/SearchPageENG.jsp

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: 2019-09-03T10:05:28.255+09:00

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 official MHLW opinions or any other regulatory policies.

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 official MHLW opinions or any other regulatory policies.

Identifiers

Other IT system identifiers

IT system
LEO

ID
10767

IT system
IUCLID4

ID
16558402024DIV750

Contact information

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Last name
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First name
Akihiko

Organisation
National Institute of Health Sciences, Japan

Department
Division of Risk Assessment

Title
Dr

Country
Japan

LITERATURE: Reverse Mutation Test of 2-Chlorobenzoyl chloride

UUID: 1b10b74b-81a1-455a-92f3-a2b96ee77776
Dossier UUID:
Author: SuperUser
Date: 2019-02-15T16:58:29.137+09:00
Remarks:

General information

Reference Type
study report

Title
Reverse Mutation Test of 2-Chlorobenzoyl chloride

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

Bibliographic source
http://dra4.nihs.go.jp/mhlw_data/jsp/SearchPageENG.jsp

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

LITERATURE: Single Dose Oral Toxicity Test of 2-Chlorobenzoyl chloride

UUID:	3f8d7050-a419-445a-a0b8-38a443c649df
Dossier UUID:	
Author:	SuperUser
Date:	2019-02-15T15:47:07.207+09:00
Remarks:	

General information

Reference Type
study report

Title
Single Dose Oral Toxicity Test of 2-Chlorobenzoyl chloride

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

Bibliographic source
http://dra4.nihs.go.jp/mhlw_data/jsp/SearchPageENG.jsp

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