I U C L I D

D a t a s e t

Existing Chemical	Substance ID: 140–11–4
CAS No.	140–11–4
EINECS Name	benzyl acetate
EINECS No.	205–399–7
Molecular Formula	C9H10O2

Dataset created by: EUROPEAN COMMISSION – European Chemicals Bureau

This dossier is a compilation based on data reported by the European Chemicals Industry following 'Council Regulation (EEC) No. 793/93 on the Evaluation and Control of the Risks of Existing Substances'. All (non–confidential) information from the single datasets, submitted in the IUCLID/HEDSET format by individual companies, was integrated to create this document.

The data have not undergone any evaluation by the European Commission.

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1.0.1 OECD and Company Information

Name: Courtaulds Chemicals(L)
Street: Macclesfield Road
Town: ST13 8UZ Leek,Staffs.
Country: United Kingdom
Phone: (0)1538 399100
Telefax: (0)1538 399025
Telex: 36327

Name: DSM Special Products B.V.
Street: P.O. Box 5489
Town: 6130 PL Sittard
Country: Netherlands

Name: Firmenich & Cie SA
Street: Avenue Charles de Gaulle 93
Town: 92521 Neuilly sue Seine Cedex
Country: France

Name: Firmenich GmbH
Street: Alfred–Nobel Strasse 46–56, Postfach 4160
Town: 50155 Kerpen
Country: Germany

Name: Firmenich SpA
Street: Via Giacomo Venezian 8
Town: 20133 Milan
Country: Italy

Name: Firmenich UK Ltd
Street: Hayes Road, Southall
Town: UB2 5NN Middlesex
Country: United Kingdom

Name: Givaudan Roure S.p.A.
Street: Via Borgogna 5
Town: 20122 Milano
Country: Italy
Phone: 2/2508 1206
Telefax: 2/2508 1205

Name: Givaudan Roure SA
Street: 55, voie des Bans, BP 24
Town: 95102 Argenteuil Cedex
Country: France
Phone: 1/39 98 15 15
Telefax: 1/39 82 00 15

Name: Haarmann & Reimer GmbH
Town: 37603 Holzminden
Country: Germany

Name: International Flavors & Fragrances
Street: Avda. Felipe Klein 2
Town: 12580 Benicarlo (Castellon)
Country: Spain
Phone: (34)64-470212
Telefax: (34)64-473411

Name: Quest International
Street: Willesborough Road
Town: TN24 0LT Ashford, Kent
Country: United Kingdom
Phone: +44 1233 644444
Telefax: +44 1233 644508
Telex: 96369

1.0.2 Location of Production Site

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1.0.3 Identity of Recipients

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1.1 General Substance Information

Substance type: organic
Physical status: liquid

1.1.1 Spectra

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1.2 Synonyms

acetic acid, benzyl ester
Source: International Flavors & Fragrances Benicarlo (Castellon)

acetic acid, phenylmethyl ester
Source: International Flavors & Fragrances Benicarlo (Castellon)

Acetic acid, phenylmethyl ester
Source: Haarmann & Reimer GmbH Holzminden

benteine
Source: International Flavors & Fragrances Benicarlo (Castellon)

Benzyl Acetate
Source: Courtaulds Chemicals(L) Leek,Staffs.

benzyl ethanoate
Source: International Flavors & Fragrances Benicarlo (Castellon)

1.3 Impurities

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1.4 Additives

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1.5 Quantity

Quantity	5 000	-	10 000 tonnes

1.6.1 Labelling

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1.6.2 Classification

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1.7 Use Pattern

Type: type
Category: Wide dispersive use

Type: industrial
Category: Personal and domestic use

Type: industrial
Category: Public domain

Type: use
Category: Cleaning/washing agents and disinfectants

Type: use
Category: Cosmetics

Type: use
Category: Food/foodstuff additives

Type: use
Category: Odour agents

1.7.1 Technology Production/Use

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1.8 Occupational Exposure Limit Values

Type of limit: other: Company Exposure Standard
Limit value: 61 other: mg/m3/8hr
Short term expos.
Limit value: 61 other: mg/m3/15m
Remark: These limits are based on the PROVISIONAL American TLV.
Source: Courtaulds Chemicals(L) Leek,Staffs.

1.9 Source of Exposure

Remark: Exposure of the general population due to use in consumer products such as: cosmetics, household and laundry cleaning products or airfreshener systems which are fragranced. Such products may contain low levels of this substance.
Source: International Flavors & Fragrances Benicarlo (Castellon)

Remark: Substance is a fragrance ingredient which is used in fragrance compositions at a level of typically a few percent.
These fragrance compositions are used to perfume a wide variety of consumer products. The level of the fragrance ingredient in the consumer product is typically a few hundreds ppm.
Source: Quest International Ashford, Kent

Remark: Normally exposure to this product to the public is in an extremely dilute form due to its use as a component in fragrances and perfumes.
The only concentrated exposure is likely to occur to fragrance manufacturing personnel or to those involved in spillage recovery following a works or traffic incident.
Source: Courtaulds Chemicals(L) Leek,Staffs.

1.10.1 Recommendations/Precautionary Measures

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1.10.2 Emergency Measures

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1.11 Packaging

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1.12 Possib. of Rendering Subst. Harmless

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1.13 Statements Concerning Waste

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1.14.1 Water Pollution

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1.14.2 Major Accident Hazards

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1.14.3 Air Pollution

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1.15 Additional Remarks

Remark: After 1991, the product was not anymore produced by Givaudan Roure, but imported into France.
Source: Givaudan Roure SA Argenteuil Cedex

Remark: None.
Source: Courtaulds Chemicals(L) Leek,Staffs.

1.16 Last Literature Search

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1.17 Reviews

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1.18 Listings e.g. Chemical Inventories

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2.1 Melting Point

Value: = –51.5 degree C
Source: International Flavors & Fragrances Benicarlo (Castellon)
(1)

2.2 Boiling Point

Value: = 213 degree C
Source: International Flavors & Fragrances Benicarlo (Castellon)
(1)

2.3 Density

Type: relative density
Value: 1.052 – 1.06 at 20 degree C
Remark: As compared to water at 4 degrees Celsius (d20/4).
Source: International Flavors & Fragrances Benicarlo (Castellon)
(2)

2.3.1 Granulometry

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2.4 Vapour Pressure

Value: = 1.9 hPa at 25 degree C
Source: International Flavors & Fragrances Benicarlo (Castellon)
(3)

2.5 Partition Coefficient

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2.6.1 Water Solubility

Value: < 1 g/l at 23 degree C
Source: International Flavors & Fragrances Benicarlo (Castellon)
(3)

2.6.2 Surface Tension

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2.7 Flash Point

Value: = 91 degree C
Type: closed cup
Method:
Year:
Source: International Flavors & Fragrances Benicarlo (Castellon)
(4)

2.8 Auto Flammability

Value: ca. 461 degree C
Source: International Flavors & Fragrances Benicarlo (Castellon)
(5)

2.9 Flammability

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2.10 Explosive Properties

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2.11 Oxidizing Properties

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2.12 Additional Remarks

Remark: When heated to decomposition, emits acrid smoke and irritating fumes.
Source: International Flavors & Fragrances Benicarlo (Castellon)
(6)

3.1.1 Photodegradation
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3.1.2 Stability in Water
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3.1.3 Stability in Soil
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3.2 Monitoring Data (Environment)
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3.3.1 Transport between Environmental Compartments
-

3.3.2 Distribution
-

3.4 Mode of Degradation in Actual Use
-

3.5 Biodegradation
-

3.6 BOD5, COD or BOD5/COD Ratio
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3.7 Bioaccumulation
-

3.8 Additional Remarks
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AQUATIC ORGANISMS

4.1 Acute/Prolonged Toxicity to Fish

Type:
Species: Cyprinus carpio (Fish, fresh water)
Exposure period: 24 hour(s)
Unit: mg/kg soil dw **Analytical monitoring:**
Method:
Year: **GLP:**
Test substance:
Remark: No toxic effect at 101-129 mg/kg (oral, carp, 24h)
No toxic effect at 68-146 mg/kg (oral, carp, 24h)
Source: International Flavors & Fragrances Benicarlo (Castellon)
(3) (3)

4.2 Acute Toxicity to Aquatic Invertebrates

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4.3 Toxicity to Aquatic Plants e.g. Algae

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4.4 Toxicity to Microorganisms e.g. Bacteria

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4.5 Chronic Toxicity to Aquatic Organisms

4.5.1 Chronic Toxicity to Fish

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4.5.2 Chronic Toxicity to Aquatic Invertebrates

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TERRESTRIAL ORGANISMS

4.6.1 Toxicity to Soil Dwelling Organisms

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4.6.2 Toxicity to Terrestrial Plants

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4.6.3 Toxicity to other Non–Mamm. Terrestrial Species

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4.7 Biological Effects Monitoring

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4.8 Biotransformation and Kinetics

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4.9 Additional Remarks

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5.1 Acute Toxicity

5.1.1 Acute Oral Toxicity

Type: LD50
Species: rat
Sex:
Number of Animals:
Vehicle:
Value: 2490 mg/kg bw
Method: other
Year: 1964 **GLP:** no
Test substance: no data
Remark: 5 male and 5 female Osborne-Mendel rats per dose. 18 hour predose fast. 2 week observation period.
Source: International Flavors & Fragrances Benicarlo (Castellon) (7)

Type: LD50
Species: rat
Sex:
Number of Animals:
Vehicle:
Value: 3690 mg/kg bw
Method: other
Year: 1945 **GLP:** no
Test substance: no data
Remark: Administered orally by stomach tube. Animals observed for 2weeks or until death. Strain not specified.
Source: International Flavors & Fragrances Benicarlo (Castellon) (8)

Type: LDLo
Species: rat
Sex:
Number of Animals:
Vehicle:
Value: > 2000 mg/kg bw
Method: other
Year: 1986 **GLP:** yes
Test substance: other TS
Remark: 250-2000 mg/kg dose groups - no effects. At 4000 mg/kg - lethal, inactive within 2 hours after dosing; 4/5 males and 2/5 females died on day 2.
Source: International Flavors & Fragrances Benicarlo (Castellon) (9)

Type: LDLo
Species: mouse
Sex:
Number of Animals:
Vehicle:
Value: > 1000 mg/kg bw
Method: other
Year: 1986 **GLP:** yes
Test substance: other TS
Remark: 250–1000 mg/kg dose levels – no effect. At 2000 mg/kg – nonspecific effects, lethal, all females inactive immediately after dosing; 1/5 males and 2/5 females died on day 2. 4000 mg/kg – lethal, all mice inactive immediately after dosing and all died on day 2.
Source: International Flavors & Fragrances Benicarlo (Castellon) (10)

Type: LD50
Species: rabbit
Sex:
Number of Animals:
Vehicle:
Value: = 2.64 mg/kg bw
Method: other
Year: 1945 **GLP:** no
Test substance: no data
Remark: Administered orally by stomach tube. Animals observed for 2weeks or until death. Strain not specified.
Source: International Flavors & Fragrances Benicarlo (Castellon) (8)

5.1.2 Acute Inhalation Toxicity

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5.1.3 Acute Dermal Toxicity

Type: LD50
Species: rabbit
Sex:
Number of Animals:
Vehicle:
Value: > 5000 mg/kg bw
Method: other
Year: 1972 **GLP:** no
Test substance: no data
Remark: 3 rabbits dosed at 5 g/kg – no effects observed.
Source: International Flavors & Fragrances Benicarlo (Castellon) (7)

5.1.4 Acute Toxicity, other Routes

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5.2 Corrosiveness and Irritation

5.2.1 Skin Irritation

Species: rabbit
Concentration:

Exposure:
Exposure Time:
Number of Animals:
PDII:
Result: moderately irritating
EC classificat.: not irritating
Method: Directive 84/449/EEC, B.4 "Acute toxicity (skin irritation)"
Year: 1984 **GLP:** yes
Test substance: no data
Source: International Flavors & Fragrances Benicarlo (Castellon)
(11)

Species: rabbit
Concentration:

Exposure:
Exposure Time:
Number of Animals:
PDII:
Result: moderately irritating
EC classificat.: not irritating
Method: Directive 84/449/EEC, B.4 "Acute toxicity (skin irritation)"
Year: 1985 **GLP:** yes
Test substance: no data
Source: International Flavors & Fragrances Benicarlo (Castellon)
(12)

Species: human
Concentration:

Exposure:
Exposure Time:
Number of Animals:
PDII:
Result: not irritating
EC classificat.: not irritating
Method: other
Year: 1967 **GLP:** no
Test substance: other TS
Source: International Flavors & Fragrances Benicarlo (Castellon)
(7)

5.2.2 Eye Irritation

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5.3 Sensitization

Type: Buehler Test
Species: guinea pig
Number of Animals:
Vehicle:
Result: not sensitizing
Classification: not sensitizing
Method: other
Year: 1986 **GLP:** yes
Test substance: no data
Remark: 20 Hartley albinos in test grooup. Induction 100% and challenged with 30 and 10% test substance in diethyl phthalate. 10% – no effects. 30% – no effects.
Source: International Flavors & Fragrances Benicarlo (Castellon) (13)

Type: Guinea pig maximization test
Species: guinea pig
Number of Animals:
Vehicle:
Result: not sensitizing
Classification: not sensitizing
Method: other
Year: 1986 **GLP:** yes
Test substance: no data
Remark: Intradermal injections in saline. Topical and challenge applications in petrolatum. Induction 10%, topical 30%. Noeffects – 10% challenge.
Source: International Flavors & Fragrances Benicarlo (Castellon) (14)

Type: Patch–Test
Species: human
Number of Animals:
Vehicle:
Result: not sensitizing
Classification: not sensitizing
Method: other
Year: 1975 **GLP:** no
Test substance: no data
Remark: 35 panelists completed the study. The vehicle was ethanol. At 18.7%, no effects.
Source: International Flavors & Fragrances Benicarlo (Castellon) (15)

Type: other
Species: human
Number of Animals:
Vehicle:
Result: not sensitizing
Classification: not sensitizing
Method: other
Year: 1967 **GLP:** no
Test substance: other TS
Remark: Human maximization test.
Source: International Flavors & Fragrances Benicarlo (Castellon) (7)

Type: other
Species: guinea pig
Number of Animals:
Vehicle:
Result: not sensitizing
Classification: not sensitizing
Method: other
Year: 1986 **GLP:** yes
Test substance: no data
Remark: 20 Hartley albino guinea pigs. Vehicle was white petrolatum. During induction material was applied at maximum nonirritating concentration (10%) on Torii's patch plaster to the shaved nape for 48 or 72 hours. At challenge (10%), no effects.
Source: International Flavors & Fragrances Benicarlo (Castellon) (16)

5.4 Repeated Dose Toxicity

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5.5 Genetic Toxicity 'in Vitro'

Type: Ames test
System of testing: TA1535, TA98, TA100, and eith TA97 or TA1537
Concentration: 33 to 10000 ug/plate
Metabolic activation: with and without
Result: negative
Method: other
Year: 1986 **GLP:** yes
Test substance: no data
Remark: The tests were conducted in up to 3 laboratories under contract to NTP. Vehicle was DMSO.
Source: International Flavors & Fragrances Benicarlo (Castellon) (17)

5.6 Genetic Toxicity 'in Vivo'

Type: Drosophila SLRL test
Species: Drosophila melanogaster **Sex:**
Strain:
Route of admin.: other
Exposure period:
Doses: 300 ppm and 2000 ppm
Result:
Method: other
Year: 1992 **GLP:** yes
Test substance: no data
Remark: No effects at 300 ppm for feeding study and 20000 ppm for the injection study.
Source: International Flavors & Fragrances Benicarlo (Castellon) (18)

Type: Micronucleus assay
Species: mouse **Sex:** male
Strain: B6C3F1
Route of admin.: i.p.
Exposure period: 3 injections at 24 hour intervals, sacrifice 24 hours after last dose.
Doses: 312.5 to 1250 mg/kg bw
Result:
Method: other
Year: 1992 **GLP:** yes
Test substance: no data
Remark: The effects of test material on bone marrow micronucleus frequency was evaluated using male mice. Vehicle was corn oil. Groups of 5 mice/dose received 3 injections of test material at 24 hour intervals. Sacrifice was 24 hours afterthe last dose. No effects at 312.5 to 1250 mg/kg.
Source: International Flavors & Fragrances Benicarlo (Castellon) (18)

Type: Sister chromatid exchange assay
Species: mouse **Sex:** male
Strain: B6C3F1
Route of admin.: i.p.
Exposure period:
Doses: 325-1700 mg/kg bw
Result:
Method: other
Year: 1992 **GLP:** yes
Test substance: no data
Remark: Vehicle was corn oil. Harvest times of 24 and 42 hours wereused. Group size was 4 mice. No effects at 325-1700 mg/kg.
Source: International Flavors & Fragrances Benicarlo (Castellon) (18)

Type: other
Species: mouse **Sex:** male
Strain: B6C3F1
Route of admin.: i.p.
Exposure period:
Doses: 325-1700 mg/kg bw
Result:
Method: other
Year: 1992 **GLP:** yes
Test substance: no data
Remark: Vehicle was corn oil. Harvest times of 17 and 36 hours wereused. Group size was 10 mice. No effects at 325-1700 mg/kg.
Source: International Flavors & Fragrances Benicarlo (Castellon) (18)

5.7 Carcinogenicity

Species: rat **Sex:** male/female
Strain: Fischer 344
Route of admin.: gavage
Exposure period: 103 weeks
Frequency of treatment: 5 days/week
Post. obs. period:
Doses: 250, 500 mg/kg bw
Result:
Control Group: yes
Method: other
Year: 1986 **GLP:** yes
Test substance: no data
Remark: "increased incidence of acinar-cell adenomas of the exocrinepancreas in male rats. No evidence of carcinogenicity was found for female rats."
Source: International Flavors & Fragrances Benicarlo (Castellon) (19)

Species: rat **Sex:** male
Strain: Fischer 344
Route of admin.: gavage
Exposure period: 103 weeks
Frequency of treatment: 5 days/week
Post. obs. period:
Doses: 250, 500 mg/kg bw
Result:
Control Group: yes
Method: other
Year: 1986 **GLP:** yes
Test substance: no data
Remark: Statistical analyses of the NTP benzyl acetate study were computed using either the animal, cage or shelf or a rack asthe experimental unit. Results from these statistical methods indicated that, using the shelf as the experimental

unit, the apparent increase in acinar cell adenomas was not statistically significant.
Source: International Flavors & Fragrances Benicarlo (Castellon)
(20)

Species: mouse **Sex:** male/female
Strain: B6C3F1
Route of admin.: gavage
Exposure period: 103 weeks
Frequency of treatment: 5 days/week
Post. obs. period:
Doses: 500, 1000 mg/kg bw
Result:
Control Group: yes
Method: other
Year: 1986 **GLP:** yes
Test substance: no data
Remark: There was some evidence of carcinogenicity in both males andfemales because of increased incidences of hepatocellular adenomas and squamous cell neoplasms of the forestomach.
Source: International Flavors & Fragrances Benicarlo (Castellon)
(19)

Species: rat **Sex:** male/female
Strain: Fischer 344
Route of admin.: oral feed
Exposure period: 103 weeks
Frequency of treatment: in diet
Post. obs. period:
Doses: 3000, 6000, 12000 ppm
Result:
Control Group: yes
Method: other
Year: 1992 **GLP:** yes
Test substance: no data
Remark: Groups of 50 F344 rats/sex/dose received test diet. An additional 10/sex/dose were fed for 15 months. Observations conducted included survival, body weight, clinical signs, food intake, hematology, clinical chemistry,pancreatic enzyme assay, necropsy and microscopy. 3000 ppm – body weight changes. 6000 ppm – body weight changes. 12000 ppm – body weight changes, decreased food intake.
Source: International Flavors & Fragrances Benicarlo (Castellon)
(18)

Species: mouse **Sex:** male/female
Strain: B6C3F1
Route of admin.: oral feed
Exposure period: 103 weeks
Frequency of treatment: in diet
Post. obs. period:
Doses: 330, 1000, 3000 ppm
Result:
Control Group: yes
Method: other
Year: 1992 **GLP:** yes
Test substance: no data
Remark: Groups of 50 mice/sex/dose received test diet for 103 weeks. An additional 10/sex/dose were fed for 15 months. Observations conducted included survival, bodyweight, clinical signs, food intake, hematology, clinical chemistry,pancreatic enzyme assay, necropsy and microscopy. 330 ppm –respiratory tract, nonneoplastic nasal lesions were seen at this dose and above. 1000 ppm – respiratory tract, body weight changes. 3000 ppm – respiratory tract, body weight changes.
Source: International Flavors & Fragrances Benicarlo (Castellon)

(21)

5.8 Toxicity to Reproduction

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5.9 Developmental Toxicity/Teratogenicity

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5.10 Other Relevant Information

Type: Chemobiokinetics general studies
Remark: Groups of F344/N rats and B6C3F1 mice (10/group) were dosed with test substance either ad lib in the feed or by gavage for 1 week. Rats and mice were fed the test substance at 10800 and 2700 ppm, respectively. Gavaged rats and mice were dosed with 500 and 1000 mg/kg bw, respectively. On day7, blood samples were collected from animals by orbital sinus bleeding with animals bled at different time intervals. Benzyl acetate was not detected in any plasma samples collected. Thought to be due to rapid hydrolysis. Plasma concentration of benzoic acid much lower in the feed study than in the gavage study for both rats and mice; hippuric acid concentrations were comparable.
Source: International Flavors & Fragrances Benicarlo (Castellon)

(22)

Type: Chemobiokinetics general studies
Remark: Groups of mice and rats were administered test substance either by gavage or intravenously. In the gavage studies, mice were dosed (3/group) at 10, 100, or 1000 mg/kg, and therats at 5, 50 and 500 mg/kg. Urine, faeces and tissue radioactivity levels were measured. No radioactivity was seen in any tissues after 24 hours. The excretion of radioactivity as a percent of dose was 63% in the urine and 0.52% in faeces in mice at 10 mg/kg, 89% in urine and 0.58% in faeces at 100 mg/kg, and 95.4% in the urine and 0.7% in faeces at 1000 mg/kg. In the rats, 69.3% in urine and 1.35%in faeces at 5 mg/kg, 94.5% in urine and 0.37% in faeces at 50 mg/kg, and 91.3% in urine and 0.98% in faeces at 500 mg/kg was observed. In the intravenous studies, mice and rats were dosed at 10 and 5 mg/kg, respectively, and urine and faeces were collected for 24 hours after the single dose. No radiactivty was seen in tissues. The excretion or radioactivity as a percent of dose was 62.3% in urine and 0.43% in faeces in the mice, and 85.5% in urine, 1.81% in faeces, and 0.2% as CO2 in expired volatiles.
Source: International Flavors & Fragrances Benicarlo (Castellon)
Test substance: Ring labeled benzyl acetate. Vehicle was corn oil.

(23)

Type: Chemobiokinetics general studies
Remark: Gooups of Fischer 344 males were given test substance in single doses of 250 and 500 mg/kg neat or 5, 250 and 500 mg/kg in corn oil by gavage. Urine and feces collected daily for 3 days. Urinary metabolites assayed. Rats sacrificed after 3 days and carcasses assayed for residual radioactivity. In all samples major urinary metabolite was hippuric acid. Benzoyl glucuronide, benzoic acid and benzylmercapturic acid also detected. Vehicle had no effecton the metabolic pattern.
Source: International Flavors & Fragrances Benicarlo (Castellon)
Test substance: The sample tested was [methylene–14C]benzyl acetate; 96% pure.

(24)

Type: Chemobiokinetics general studies
Remark: Tissue distribution and metabolism was evaluated after patchremoval or 18 hours after removal of a 6 hour closed patch. Male 344 rats were used. Vehicle was ethanol. At 1%, about50% of the dose was recovered in the urine. Recovery at theapplication site was 3.7% at patch removal and 1.2% 18 hourslater. Total recovery was 79%. Hippuric acid was always the major urinary metabolite, but the proportion of benzoyl glucuronide increased with topical dose. Other minor metabolites included benzoic acid and benzyl mercapturic acid.
Source: International Flavors & Fragrances Benicarlo (Castellon)

(25)

Type: Metabolism
Remark: The esters of benzyl alcohol, such as the acetate, benzoate,cinnamate and hydrocinnamate, are rapidly hydrolysed in vivoto benzyl alcohol which is then oxidized to benzoic acid andexcreted as hippuric acid (Williams, 1959).
Source: International Flavors & Fragrances Benicarlo (Castellon)

(7)

Type: other
Remark: Fresh, full-thickness healthy skin from surgery (human) or from male Fischer 344 rats. The test material was applied to the skin under occlusion in a flow through diffusion cellfor up to 72 hours. Radiactivity was measured on skin, in skin and in receptor fluid. At 24 hours, absorption was 5.5% and 34.3% of the dose for human and rat skin, respectively. At 72 hours, 17.8% and 55.8% of the dose was absorbed.
Source: International Flavors & Fragrances Benicarlo (Castellon)
Test substance: The sample tested was [methylene-14C]benzyl acetate.

(26)

Type: other
Remark: Urinary excretion of radioactivity was measured for 5 days after a single unoccluded application in acetone or a moisturizing lotion, under a plastic wrap occlusion patch, and under a glass chamber occlusion patch. Skin absorption under unoccluded conditions in acetone was 34.6% of the applied dose. Absorption using the moisturizing lotion was similar to that noted with the acetone vehicle. Under plastic wrap occlusion, 17.3% was absorbed, and 78.7% of thedose absorbed with glass chamber occlusion.
Source: International Flavors & Fragrances Benicarlo (Castellon)
Test substance: The sample tested was [7-14C]benzyl acetate.

(27)

5.11 Experience with Human Exposure

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(1) SAX

(2) IFF Data

(3) IFRA/IOFI, September 1986

(4) Analytical Specifications, IFF

(5) Sax's Dangerous Properties of Industrial Materials, Eighth Edition, edited by R. J. Lewis, Sr. Van Nostrand Reinhold Company, New York, 1994.

(6) Sax's Dangerour Properties of Industrial Materials, Eighth Edition. edited by R.J. Lewis, Sr. Van Nostrand Reinhold Company, New York. 1994.

(7) Food and Chemical Toxicology 11 p875, 1973

(8) Graham B.E., Kuizenga M.H. Toxicity studies of benzyl benzoate and related benzyl compounds. J. Pharmac. exp. Ther. 84(4), 358-362, 1945.

(9) National Toxicology Program. Toxicology and carcinogenesis studies of benzyl acetate in F344/N rats and B6CF1 mice (gavage studies). NTP-TR-250; PB-86-2506.

(10) National Toxicology Program. Toxicology and carcinogenesis studies of benzyl acetate in F344/N rats and B6CF1 mice (gavage studies), NTP-TR-250; PB-86-2506, 1986.

(11) RIFM study. 1984.

(12) RIFM study. 1985.

(13) RIFM study. 1986.

(14) RIFM study. 1986

(15) IFF study. 1975

(16) RIFM study, 1986.

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7.1 Risk Assessment

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