

8EHQ-0695-13456

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DuPont Central Research  
and Development



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INIT 06/05/95

95 JUN -5 AM 10:57

June 2, 1995

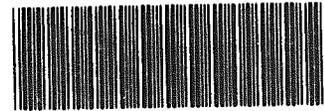
EXPRESS MAIL - RETURN RECEIPT REQUESTED

Document Processing Center (TS-790)  
Attention 8(e) Coordinator  
Office of Pollution Prevention and Toxics  
U.S. Environmental Protection Agency  
401 M Street SW  
Washington, D.C. 20460

Contains No CBI

Dear 8(e) Coordinator:

**1,5,9-Cyclododecatriene**  
**CAS # 4904-61-4**



88950000240

Enclosed, please find a copy of the EUCLID dossier for the above referenced material which was prepared by Huels AG, Germany. We recently obtained a copy and upon review noted that the dossier made reference to several unpublished studies which would appear to be reportable, based upon the EPA TSCA Section 8(e) Reporting Guide (June 1991).

DuPont does not have copies of the unpublished studies from Huels AG or Shell Research Ltd. and thus has not critically reviewed the significance of the reported findings.

Sincerely,

*C. Michael Kaplan for CFR*

Charles F. Reinhardt, M.D.  
Director

95 JUN 14 AM 8:05  
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Phone: (302)366-5285  
CFR/AMK/dlj

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EUCLID  
1993

Data Sheet  
1993-5 AM 10:58

CAS-No.: 4904-61-4  
EINECS-No.: 225-533-8  
IUPAC-Name: cyclododeca-1,5,9-triene

**Producer Related Part**

Company: Huels AG  
creation date: 06-SEP-93

**Substance Related Part**

Company: Huels AG  
creation date: 06-SEP-93

Printing date: 09-JUN-94  
Revision date: 01-JUN-94  
Date of last Update: 17-MAY-94

Number of Pages 22

1.1 General Substance Information

Molecular formula: C<sub>12</sub>H<sub>18</sub>  
Molecular weight: 162.28  
Smiles code: C1=CCCC=CCCC=CCC1

Substance type: organic  
Physical status: liquid  
Purity: > 99.5 % w/w

Remark: Data of the substance related part are submitted on behalf of the following companies (detailed addresses in 1.01):

-----  
Du Pont de Nemours International S.A., Antwerp (Belgium)  
Shell Chimie, Rueil-Malmaison (France)

1.2 Synonyms

1,5,9-Cyclododecatriene  
CDT  
Cyclododecatrien-1,5,9

1.3 Impurities

-

1.4 Additives

-

1.5 Quantity

-

1.6.1 Labelling

Labelling: provisionally by manufacturer/importer

Symbols: Xn  
N

R-Phrases: (20) Harmful by inhalation.  
(51/53) Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-Phrases: (23) Do not breathe gas/fumes/vapour/spray .  
(24) Avoid contact with skin.

(1)

## 1. General Information

date: 09-JUN-94  
CAS-No.: 4904-61-4

### 1.6.2 Classification

Classification: provisionally by manufacturer/importer  
Class of danger: dangerous for the environment  
R-Phrases: (51/53) Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

(1)

Classification: provisionally by manufacturer/importer  
Class of danger: harmful  
R-Phrases: (20) Harmful by inhalation.

(1)

### 1.7 Use Pattern

### 1.8 Occupational Exposure Limit Values

Type of limit: MAK (DE)  
Limit value:  
Country: Germany  
Remark: MAK-Wert not established

### 1.9 Sources of Exposure

### 1.10 Water Pollution

Classified by: other: Huels AG  
Labelled by: other: Huels AG  
Class of danger: 2 (water polluting)  
Country: Germany

(1)

### 1.11 Major Accident Hazards

Legislation: Stoerfallverordnung (DE)  
Substance listed: no  
Country: Germany

**1. General Information**

date: 09-JUN-94  
CAS-No.: 4904-61-4

**1.12 Air Pollution**

Classified by: other: Huels AG  
Labelled by: other: Huels AG  
Class of danger: II  
Country: Germany

Number: 3.1.7 (organic substances)

**1.13 Additional Remarks**

2. Physico-chemical Data

date: 09-JUN-94  
CAS-No.: 4904-61-4

2.1 Melting Point

Value: = -18 degree C  
Method: other: no data  
Year: GLP: no data (2)

Value: ca. -17 degree C  
Decomposition: no  
Year: GLP: no (1)

2.2 Boiling Point

Value: = 227 degree C at  
Method: other: no data  
Year: GLP: no data (2)

Value: = 237 degree C at 1013 hPa  
Year: GLP: no (1)

2.3 Density

Type: density  
Value: ca. .892 g/cm3 at 20 degree C  
Year: GLP: no (2) (1)

2.4 Vapour Pressure

Value: ca. .12 hPa at 20 degree C  
Year: GLP: no  
Remark: Extrapolated from the experimentally determined vapour  
pressure curve in the source referenced:  
237.5 degree C: 760 Torr = 1013 hPa  
210.6 400 533  
161.8 100 133  
119.0 20 26.7  
104.0 10 13.3  
 $\log (VP) = -2708 * (1/T) + 8.32348$  (T in K, VP in hPa) (1)

Value: = 1.3 hPa at 50 degree C  
Year: GLP: no data (2)

2. Physico-chemical Data

date: 09-JUN-94  
CAS-No.: 4904-61-4

2.5 Partition Coefficient

log Pow: = 4.1 at 25 degree C  
Method: OECD Guide-line 107 "Particion Coefficient  
(n-octanol/water), Flask-shaking Method"  
Year: 1981 GLP: yes  
Source: Shell International Chemical Company Ltd. (3)

log Pow: = 4.5 at 23 degree C  
Method: OECD Guide-line 107 "Partition Coefficient  
(n-octanol/water), Flask-shaking Method"  
Year: 1981 GLP: no (4)

log Pow: = 5.076 at degree C  
Method: other (calculated): CLOGP3 Computer Program, MedChem  
Project, Pomona College  
Year: 1989 GLP:

2.6 Water Solubility

Value: = 5 mg/l at 20 degree C  
Qualitative: of very low solubility  
Year: GLP: no (1)

2.7 Flash Point

Value: ca. 88 degree C  
Type: closed cup  
Method: other: DIN 51755  
Year: GLP: no (1)

Value: = 93 degree C  
Type:  
Method: other: PMCC  
Year: GLP: no data (2)

2.8 Auto Flammability

2. Physico-chemical Data

date: 09-JUN-94  
CAS-No.: 4904-61-4

2.9 Flammability

-

2.10 Explosive Properties

-

2.11 Oxidizing Properties

-

2.12 Additional Remarks

Remark: Explosive limits: lower limit: 1 Vol.-%  
upper limit: 4 Vol.-%  
Ignition temperature: ca. 244 degree C (DIN 51794)

(1)

### 3. Environmental Fate and Pathways

date: 09-JUN-94  
CAS-No.: 4904-6174

#### 3.1.1 Photodegradation

Type: air  
Indirect photolysis  
Sensitizer: OH  
Conc. of sens.: 500000 molecule/cm<sup>3</sup>  
Rate constant: = .000000001748 cm<sup>3</sup>/(molecule \* sec)  
Degradation: = 50 % after .2 day  
Method: other (calculated): AOP Computer Program, Vers. 1.53,  
Syracuse Research Center (based on Reference)  
Year: 1994 GLP:  
Test substance:  
Remark: half-life refers to 12 hour-days

(5)

#### 3.1.2 Stability in Water

-

#### 3.1.3 Stability in Soil

-

### 3.2 Monitoring Data (Environment)

-

#### 3.3.1 Transport between Environmental Compartments

Type: adsorption  
Medium: water - soil  
Method: other: calculated (see Reference)  
Year: 1981  
Result: Koc is calculated to be = 12996.96  
Source: Shell International Chemical Company Ltd.

(6)

Type: volatility  
Medium: water - air  
Method: other: see Reference  
Year: 1982  
Result: Based on a calculated Henry's law constant of 389 Pa m<sup>3</sup>/mol (Mackay level 1 Fugacity calculation), the volatilisation half-life of cyclododecatriene in a model river, depth 1 m and current 1 m/s and at a wind velocity of 3 m/s, is estimated to be 4.0 hours.  
Source: Shell International Chemical Company Ltd.

(7)

## 3.3.2 Distribution

Media: air - biota - sediment(s) - soil - water  
 Method: Calculation according Mackay, Level I  
 Year: 1991  
 Result: air: 95.9 %  
 water: 0.70 %  
 soil: 1.76 %  
 sediment: 1.64 %  
 susp. aq. mat.: 0.00 %  
 biota: 0.00 %  
 Source: Shell International Chemical Company Ltd.

(8)

Media: air - biota - sediment(s) - soil - water  
 Method: Calculation according Mackay, Level I  
 Year:  
 Result: Air: 95.877 %  
 Soil: 1.769 %  
 Water: 0.700 %  
 Sediment: 1.653 %  
 Biota: 0.001 %  
 Source: Huels AG, Marl  
 Test condition: Data used:  
 Molar mass: 162.28 g/mol  
 Log Pow: 4.50  
 Vapour pressure: 12 Pa  
 Water solubility: 0.005 g/l

-----  
 Equations used for additional data:  
 $\log K_{oc} = 0.989 \log Pow - 0.346$   
 -----

Volumes used:  
 Air: 6 000 000 000  
 Soil: 45 000  
 Water: 7 000 000  
 Sediment: 35 + 21 000  
 Biota: 7

## 3.4 Mode of Degradation in Actual Use

Result: Since the substance is used as an intermediate, it will be converted into other chemical substances in actual use and thus no longer exist. Any quantities that escape into the environment will mainly partition into air and be degraded by reaction with atmospheric OH radicals (indirect photodegradation).

## 4.2 Acute and Prolonged Toxicity to Aquatic Invertebrates (e.g. Daphnia)

Species: Daphnia magna (Crustacea)  
 Exposure period: 24 hour  
 Unit: mg/l Analytical monitoring: no  
 EC50: = 2.9  
 Method: other: Daphnien-Kurzzeitest, DIN 38412 Teil 11, Bestimmung der Wirkung von Wasserinhaltsstoffen auf Kleinkrebse  
 Year: GLP: no  
 Test substance: as prescribed by 1.1 - 1.4

(14)

Species: Daphnia magna (Crustacea)  
 Exposure period: 48 hour  
 Unit: mg/l Analytical monitoring: no  
 EC50: ca. 5  
 Method: other: no data  
 Year: 1982 GLP: yes  
 Test substance: other TS: Shell  
 Remark: The 24 h EC50 was calculated to be 22 mg/l.  
 Source: Shell International Chemical Company Ltd.  
 Test condition: All test solutions, including controls contained 0.5 ml/l of acetone. No compensation was made for volatility such as covering the test vessels. Static system, the test solution was not renewed.

(13)

## 4.3 Toxicity to Aquatic Plants (e.g. Algae)

Species: Selenastrum capricornutum (Algae)  
 Endpoint: growth rate  
 Exposure period: 4 day  
 Unit: mg/l Analytical monitoring: no  
 EC50: ca. 140  
 Method: other: no data  
 Year: 1982 GLP: yes  
 Test substance: other TS: Shell  
 Remark: The result is based on the growth rates over the period day 2 to day 4 and is higher than the quoted water solubility of 1,5,9-cyclododecatriene.  
 Source: Shell International Chemical Company Ltd.  
 Test condition: All test solutions, including controls contained 0.5 ml/l of acetone. No compensation was made for volatility such as covering the test vessels. Static system.

(13)

#### 4. Ecotoxicity

##### 4.1 Acute and Prolonged Toxicity to Fish

Type: static  
Species: Carassius auratus (Fish, fresh water)  
Exposure period: 24 hour  
Unit: mg/l Analytical monitoring: yes  
LC50: = 4  
Method: other: APHA Standard Method No. 231  
Year: 1971 GLP: no data  
Test substance: no data

(11)

Type: static  
Species: Leuciscus idus (Fish, fresh water)  
Exposure period: 48 hour  
Unit: mg/l Analytical monitoring: no  
LC50: = 4.8  
Method: other: Bestimmung der Wirkung von Wasserinhaltsstoffen auf Fische, DIN 38412 Teil 15  
Year: GLP: no  
Test substance: as prescribed by 1.1 - 1.4

(12)

Type: static  
Species: Oncorhynchus mykiss (Fish, fresh water)  
Exposure period: 96 hour  
Unit: mg/l Analytical monitoring: no  
LC50: ca. 5.5  
Method: other: No data  
Year: 1982 GLP: yes  
Test substance: other TS: Shell  
Source: Shell International Chemical Company Ltd.  
Test condition: All test solutions, including controls contained 0.5 ml/l of acetone. No compensation was made for volatility such as covering the test vessels. The test solution was renewed daily.

(13)

### 3. Environmental Fate and Pathways

date: 09-JUN-94  
CAS-No.: 4904-61-4

#### 3.5 Biodegradation

Type: aerobic  
Inoculum: predominantly domestic sewage  
Concentration: 2 mg/l related to Test substance  
Degradation: = 0 % after 28 day  
Method: OECD Guide-line 301 D "Ready Biodegradability: Closed Bottle Test"  
Year: 1981  
Test substance: as prescribed by 1.1 - 1.4

GLP: no

(9)

#### 3.6 BOD5, COD and BOD5/COD Ratio

##### B O D 5

Method: other: APHA Standard Method No. 219  
Year: 1971  
BOD5: = 20 mgO<sub>2</sub>/l

GLP: no data

##### C O D

Method: other: ASTM D, 1252-1267  
Year: 1974  
COD: = 3020 mg/g substance

GLP: no data

##### R a t i o B O D 5 / C O D

BOD5/COD: = .007

Remark: unit of BOD5 = mg O<sub>2</sub>/g substance  
ThOD = 3260 mg O<sub>2</sub>/g substance  
COD = 92.6 % of ThOD

(10)

#### 3.7 Bioaccumulation

-

#### 3.8 Additional Remarks

-

#### 4. Ecotoxicity

date: 03-08-94  
CAS-No.: 4904-61-4

##### 4.4 Toxicity to Microorganisms (e.g. Bacteria)

Type: aquatic  
Species: Pseudomonas putida (Bacteria)  
Exposure period: 6 hour  
Unit: g/l Analytical monitoring: no  
EC10: = 10.4  
Method: other: Sauerstoff-Konsumptionstest, Huels-Verfahren,  
Pseudomonas putida, 5-6 Stdn.  
Year: GLP: no  
Test substance: as prescribed by 1.1 - 1.4  
Remark: Wegen der geringen Loeslichkeit in Wasser (ca. 5 mg/l bei 20  
Grad Celsius) erfolgte die Untersuchung mit Aceton als  
Loesevermittler.

(15)

##### 4.5 Chronic Toxicity to Aquatic Organisms

###### 4.5.1 Chronic Toxicity to Fish

-

###### 4.5.2 Chronic Toxicity to Aquatic Invertebrates (e.g. Daphnia)

-

#### TERRESTRIAL ORGANISMS

##### 4.6.1 Toxicity to Soil Dwelling Organisms

-

**4.6.2 Toxicity to Terrestrial Plants**

-

**4.6.3 Toxicity to Other Non-mammalian Terrestrial Organisms**

-

**4.7 Biological Effects Monitoring**

-

**4.8 Biotransformation and Kinetics Excluding Mammals**

-

**4.9 Additional Remarks**

-

## 5. Toxicity

date: 09-JUN-94  
CAS-No.: 4904-61-4

### 5.1 Acute Toxicity

#### 5.1.1 Acute Oral Toxicity

Type: LD50  
Species: rat  
Value: = 4150-4664 mg/kg  
Method: OECD Guide-line 401 "Acute Oral Toxicity"  
Year: 1981 GLP: no  
Test substance: as prescribed by 1.1 - 1.4  
Remark: 30 minutes after application animals showed abnormal symptoms (restlessness, rough skin, decrease of responsiveness, hunched posture, diarrhoea, moderate to severe tremors, convulsions, sedation, prone position). Those animals surviving the test appeared normal after 5 days at the latest. In the higher dosage groups animals died after 6 to 48 hours after application. When submitted to autopsy those animals which died during the test showed redness of the mucosa of the gut and stomach and an accumulation of liquor. Animals which survived the study showed no pathological changes.

(16)

Type: LD50  
Species: rat  
Value: = 1780-2300 mg/kg  
Method:  
Year: GLP: no  
Test substance: other TS: purity > 98%  
Remark: Wistar rats (5/sex/dose)  
The major clinical sign of intoxication was the occurrence of violent tremors within 30 min. of dosing lasting for several hours.

(17)

Type: LD50  
Species: rat  
Value: = 2300 mg/kg  
Method: other: no data  
Year: GLP: no  
Test substance: other TS: Shell  
Remark: Strain: CFE Wistar  
5 males and 5 females/group  
Doses between 1.5 and 5.5 ml/kg undiluted  
LD50 = 2.6 ml/kg, 95 % Confidence limits: 2.0 - 3.06 ml/kg  
The major clinical sign of intoxication was the occurrence of violent tremors within 30 min. of dosing lasting for several hours.

Source: Shell International Chemical Company Limited

(18)

## 5. Toxicity

date: 09-JUN-94  
CAS-No.: 4904-61-4

### 5.1.2 Acute Inhalation Toxicity

Type: LC50  
Species: rat  
Exposure time: 6 hour  
Value: = 7.5-8.9 mg/l  
Method: other: see reference  
Year: 1965  
Test substance: no data  
Remark: The major pharmacotoxic signs observed during exposure were gasping, twitching and severe muscle spasms.  
GLP: no  
(19)

### 5.1.3 Acute Dermal Toxicity

Type: LD50  
Species: rat  
Value: > 3600 mg/kg  
Method:  
Year:  
Test substance: other TS: purity > 98%  
Remark: 2 animals/sex/dose  
There were no mortalities and no report of signs of toxicity. All animals were seen to have eschar at the application site on removal of the occlusive dressing.  
GLP: no  
(20)

### 5.1.4 Acute Toxicity, Other Routes

## 5.2 Corrosivness and Irritation

### 5.2.1 Skin Irritation

Species: rabbit  
Result: not irritating  
EC classification:  
Method: OECD Guide-line 404 "Acute Dermal Irritation/Corrosion"  
Year: 1981  
Test substance: as prescribed by 1.1 - 1.4  
Remark: irritation index: 1.25/8  
redness: x=1.00  
edema : x=0.61  
GLP: no  
(21)

5. Toxicity

date: 09-JUN-04  
CAS-No.: 4904-61-4

Species: rabbit  
Result:  
EC classification:  
Method:  
Year: GLP: no  
Test substance: other TS: purity > 98%  
Remark: 1 ml of undiluted test substance was applied to the skin of rabbits (New Zealand White) under an occlusive dressing for 1, 3 or 10 minutes (1/sex/time period) with sacrifice for histology at 7 days, and for 1 hour (3/sex) and 4 hours (4/sex) with sacrifices at 24 and 72 hours and 7 days.

irritation index:  
erythema: x = 1.75  
edema : x = 1.65

Exposure of the skin for 1 or 4 hours resulted in skin irritation with eschar formation, and necrosis with dermal involvement. However, the scores would not trigger an classification as irritating under current EEC legislation. (20)

Species: rabbit  
Result: not irritating  
EC classification:  
Method:  
Year: GLP: yes  
Test substance: other TS: purity > 98%  
Remark: irritation index:  
erythema: x = 1.35  
edema : x = 0.79

At 4 hours after application 5/6 rabbits exhibited very slight superficial necrosis. 2/6 later (at 48 and 72 hours) developed small areas of chemical burning. (22)

Species: other: rabbit/guinea pig/mouse  
Result:  
EC classification:  
Method: other: see reference  
Year: 1968 GLP: no  
Test substance: other TS: purity > 90%  
Remark: The irritation was reported to be very severe. No further details reported.  
Not classifiable according to current EEC directives. (23)

## 5.2.2 Eye Irritation

Species: rabbit  
 Result: not irritating  
 EC classification:  
 Method: OECD Guide-line 405 "Acute Eye Irritation/Corrosion"  
 Year: 1981 GLP: no  
 Test substance: as prescribed by 1.1 - 1.4  
 Remark: irritation index: 3/110  
 cornea : x=0.17  
 iris : x=0  
 conjunctivae  
 -----  
 redness : x=0.50  
 chemosis: x=0.22

(24)

Species: rabbit  
 Result: irritating  
 EC classification:  
 Method: other: see reference  
 Year: 1968 GLP: no  
 Test substance: other TS: purity > 90%  
 Remark: Substance was an immediate irritant but produced only a mild  
 conjunctivitis which faded within 48 hours. No further  
 details reported.  
 Not classifiable according to current EEC directives.

(23)

## 5.3 Sensitization

Type: Guinea pig maximation test  
 Species: guinea pig  
 Result: not sensitizing  
 Classification:  
 Method: OECD Guide-line 406 "Skin Sensitization"  
 Year: 1981 GLP: no  
 Test substance: as prescribed by 1.1 - 1.4  
 Remark: Results: 2/20 animals showed a sensitization 24 hours,  
 1/20 animals 48 hours after the patch test.

(25)

Type: Guinea pig maximation test  
 Species: guinea pig  
 Result: not sensitizing  
 Classification:  
 Method:  
 Year: GLP: yes  
 Test substance: other TS: purity > 98%  
 Remark: None of 20 test animals showed any positive response at  
 either 24 or 48 hours after removal of the challenge  
 patches.

(26)

## 5. Toxicity

date: 09-JUN-94  
CAS-No.: 4904-61-4

Type: no data  
Species: guinea pig  
Result:  
Classification:  
Method: other: see reference  
Year: 1968 GLP: no  
Test substance: other TS: purity > 90%  
Remark: The material was administered to ten guinea pigs each as a 0.1 % solution in light liquid paraffin. Substance was a potent skin sensitizer in both the topical and intradermal tests. No further details reported.  
Not classifiable according to current EEC directives. (23)

### 5.4 Repeated Dose Toxicity

Species: rat Sex: male  
Strain: other: Charles-River  
Route of admin.: inhalation  
Exposure period: 6 hours/day, 10 days  
Freq. of treatment:  
Post. obs. period: none  
Doses: 1.64 mg/L  
Control Group: no  
Method: other: see reference  
Year: 1965 GLP: no  
Test substance: no data  
Remark: 20 rats were exposed to an aerosol concentration of 1.64 mg/L. At the end of the exposure period the animals were autopsied and tissue sections of the lung, liver, spleen, kidneys, bone marrow (femur) and brain were examined histopathologically.  
No major toxic signs were observed during exposure. Peripheral vasodilatation was apparent throughout the entire study. No deaths occurred. Mean and individual weight gains appeared normal. The tissues of the major organs appeared normal at the terminal autopsy. (27)

### 5.5 Genetic Toxicity in Vitro

Type: Ames test  
System of testing: Salmonella typhimurium TA 98, TA 100, TA 1535, TA 1537, TA 1538.  
Concentration: up to 5000 ug/plate  
Metabolic activat.: with and without  
Result: negative  
Method: other: according to Ames, B.N. et al., Mutat. Res. 31, 347-364  
Year: 1975 GLP: no  
Test substance: as prescribed by 1.1 - 1.4  
Remark: solvent: DMSO (28)

## 5. Toxicity

Type: Ames test  
System of testing: Salmonella typhimurium TA 98, TA 100, TA 1535, TA 1537, TA 1538  
Concentration: up to 4000 µg/plate  
Metabolic activat.: with and without  
Result: negative  
Method:  
Year:  
Test substance: other TS: purity > 98% GLP: yes  
Remark: plate incorporation assay  
solvent: mixture of Tween 80 and ethanol

(26)

Type: Escherichia coli reverse mutation assay  
System of testing: Escherichia coli WP2 uvrA pKM101  
Concentration: up to 4000 µg/plate  
Metabolic activat.: with and without  
Result: negative  
Method:  
Year:  
Test substance: other TS: purity > 98% GLP: yes  
Remark: plate incorporation assay  
solvent: mixture of Tween 80 and ethanol

(26)

Type: Mitotic recombination in Saccharomyces cerevisiae  
System of testing: Saccharomyces cerevisiae JD1  
Concentration: up to 5000 µg/ml  
Metabolic activat.: with and without  
Result: negative  
Method:  
Year:  
Test substance: other TS: purity > 98% GLP: yes  
Remark: liquid suspension  
solvent: Tween 80/ethanol  
significant cytotoxicity was observed above 0.1 mg/ml

(26)

## 5.6 Genetic Toxicity in Vivo

5. Toxicity

5.7 Carcinogenicity

-

5.8 Toxicity to Reproduction

-

5.9 Developmental Toxicity/Teratogenicity

-

5.10 Additional Remarks

Type: Metabolism  
Remark: The effects of feeding cyclododecatriene (30 or 50.2 moles/g diet for 2 weeks) to female mice on glutathione S-transferase (GST) activity in the liver, intestinal mucosa and the forestomach were determined. In the liver and intestinal mucosa the activity was increased almost 4fold, whereas in the forestomach no significant increase was observed.

(29)

Type: Biochemical or cellular interactions  
Remark: When the cyclododecatriene was applied to the skin of guinea pigs, a thickening of the skin and an increase in epidermal arginase activity was observed.

(30)

5.11 Experience with Human Exposure

-

- (1) Sicherheitsdatenblatt Huels AG vom 23.03.94
- (2) Shell Chemicals: Safety data sheet  
"1,5,9-Cyclododecatriene", 01 July 1993, 7pp.
- (3) Bennet, D. and Bryant, K.: Toxicology of fine chemicals:  
cyclododecatriene. Partition coefficient (Pow) for the  
octanol/water system. Sittingbourne, Shell Research Limited  
Technical Report SBTR.82.042, 1982
- (4) Huels study, 1989 (unpublished)
- (5) Atkinson, R.: A structure-activity relationship for the  
estimation of rate constants for the gas-phase reactions of  
OH radicals with organic compounds. Int J. Chem. Kinet. 19,  
799-828 (1987)
- (6) Karickhoff, S.W., Chemosphere 10, 833-846 (1981)
- (7) Lyman, W.J. et al., Handbook of chemical property estimation  
methods, McGraw-Hill, New York, 1982 (Chapter 15)
- (8) Mackay, D.: Multimedia environmental models; the fugacity  
approach. Lewis Publishers Inc., Chelsea (Michigan, USA),  
1991 (chapter 5)
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