

MATERIAL SAFETY DATA SHEET

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Version 1.4

Section 1 - Product and Company Information

Product Name CITRAL (CIS+TRANS)
Product Number 27450
Brand FLUKA

Company Sigma-Aldrich
Address 3050 Spruce Street
SAINT LOUIS MO 63103 US

Technical Phone: 800-325-5832
Fax: 800-325-5052
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
CITRAL (CIS+TRANS)	5392-40-5	No

Formula C10H16O
Synonyms Citral * 3,7-Dimethyl-2,6-octadienal * Lemsyn GB
* NCI-C56348
RTECS Number: RG5075000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Harmful.

Possible risk of harm to the unborn child. May cause sensitization by skin contact.

Causes severe irritation.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

EYE EXPOSURE

Assure adequate flushing of the eyes by separating the eyelids with fingers.

Section 5 - Fire Fighting Measures

FLASH POINT

203 °F 95 °C Method: closed cup

EXPLOSION LIMITS

Lower: 4.3 % Upper: 9.9 %

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

Unsuitable: Do not use water.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed. Store in a cool dry place.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT

Other: Wear appropriate government approved respirator, chemical-resistant gloves, safety goggles, other protective clothing.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance

Color: Slightly yellow-green

Form: Clear liquid

Property

Value

At Temperature or Pressure

Molecular Weight

152.24 AMU

pH

N/A

BP/BP Range

220.0 - 225.0 °C

MP/MP Range

N/A

Freezing Point	N/A	
Vapor Pressure	< 1 hPa	50 °C
Vapor Density	5 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.888 g/cm ³	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	203 °F 95 °C	Method: closed cup
Explosion Limits	Lower: 4.3 % Upper: 9.9 %	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	1.487	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Materials to Avoid: Strong oxidizing agents, Strong acids, Strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Multiple Routes: High concentrations are extremely destructive to tissues of the mucous membranes and upper respiratory tract, eyes, and skin. Harmful if swallowed, inhaled, or absorbed through skin.

SENSITIZATION

Skin: May cause allergic skin reaction.

SIGNS AND SYMPTOMS OF EXPOSURE

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

TOXICITY DATA

Oral

Rat

4960 mg/kg

LD50

Remarks: Behavioral:Somnolence (general depressed activity).

Intraperitoneal
Rat
460 MG/KG
LD50

Oral
Mouse
6000 mg/kg
LD50
Remarks: Tumorigenic:Active as anti-cancer agent.

Skin
Rabbit
2250 mg/kg
LD50

IRRITATION DATA

Skin
Human
40 mg
24H
Remarks: Mild irritation effect

Skin
Man
16 mg
48H
Remarks: Severe irritation effect

Skin
Rabbit
500 mg
24H
Remarks: Moderate irritation effect

Skin
Rabbit
100 mg
24H
Remarks: Severe irritation effect

Skin
Pig
50 mg
48H
Remarks: Severe irritation effect

Skin
Guinea pig
1 %
48H
Remarks: Moderate irritation effect

Skin
Guinea pig
100 mg
24H
Remarks: Severe irritation effect

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 1250 MG/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 10 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Effects on Newborn: Sex ratio.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Species: Rat
Dose: 2500 MG/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated). Specific Developmental Abnormalities: Other developmental abnormalities.

Species: Rat
Dose: 10 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Maternal Effects: Other effects. Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or Fetus: Fetal death.

Species: Rat
Dose: 28 GM/KG
Route of Application: Skin
Exposure Time: (60D PRE)
Result: Maternal Effects: Oogenesis. Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 46 GM/KG
Route of Application: Skin
Exposure Time: (14W PRE)
Result: Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Rat
Dose: 46 GM/KG
Route of Application: Skin
Exposure Time: (14W PRE)
Result: Effects on Fertility: Other measures of fertility
Maternal Effects: Ovaries, fallopian tubes. Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Rat
Dose: 27600 MG/KG
Route of Application: Skin
Exposure Time: (60D PRE)
Result: Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).

Species: Rat
Dose: 1800 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (22W PRE)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Maternal Effects: Oogenesis.
Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 1800 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (6D PRE)
Result: Maternal Effects: Ovaries, fallopian tubes. Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: None
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

IATA

Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: Xi
Indication of Danger: Irritant.
R: 38-43
Risk Statements: Irritating to skin. May cause sensitization by skin contact.
S: 24/25-37
Safety Statements: Avoid contact with skin and eyes. Wear suitable gloves.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Harmful.
Risk Statements: Possible risk of harm to the unborn child. May cause sensitization by skin contact.
Safety Statements: In case of accident or if you feel unwell,

seek medical advice immediately (show the label where possible). In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. Do not breathe vapor. US Statements: Causes severe irritation.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.