Tetrahydrofuran: sc-222349

MATERIAL SAFETY DATA SHEET

1 Identification of substance:

Product Name: **Tetrahydrofuran**

Catalog Number: sc-222349

Supplier: Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

Emergency: ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

2 Hazards identification

Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008

GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapour.

GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.

GHS07

Eye Irrit. 2 H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC

Xn; Harmful

R40: Limited evidence of a carcinogenic effect.

Xi; Irritant

R36/37: Irritating to eyes and respiratory system.

F; Highly flammable

R11: Highly flammable.

R19: May form explosive peroxides.

Information concerning particular hazards for human and environment: Not applicable

Label elements
Labelling according to Regulation (EC) No 1272/2008
The substance is classified and labelled according to the CLP regulation.

Hazard pictograms

GHS02 GHS07 GHS08

Signal word *Danger*
Hazard statements
H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H351 Suspected of causing cancer.
H335 May cause respiratory irritation.
Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard description:
WHMIS classification
B2 - Flammable liquid
D2B - Toxic material causing other toxic effects

Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH	1
FIRE	3
REACTIVITY	1

Health (acute effects) = 1
Flammability = 3
Reactivity = 1

Other hazards
Results of PBT and vPvB assessment
PBT: *Not applicable.*
vPvB: *Not applicable.*

3 Composition/information on ingredients

Chemical characterization: Substances
CAS# Description:
109-99-9 Tetrahydrofuran
Identification number(s):
EC number: *203-726-8*
Index number: *603-025-00-0*
Impurities and stabilising additives:
Stabilized with:
BHT (butylated hydroxytoluene) (CAS# 128-37-0)

4 First aid measures

Description of first aid measures
After inhalation
Supply fresh air or oxygen; call for doctor.
In case of unconsciousness place patient stably in side position for transportation.
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
If skin irritation continues, consult a doctor.
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing
Drink lots of water.
Administer medicinal carbon
Administer a solution of sodium carbonate.
Do not give milk or fatty oils.
Do not initiate vomiting.
Information for doctor
Most important symptoms and effects, both acute and delayed
No further relevant information available.
Danger *If swallowed or in case of vomiting, danger of entering the lungs.*
Indication of any immediate medical attention and special treatment needed
No further relevant information available.

5 Firefighting measures

Extinguishing media
Suitable extinguishing agents *CO2, sand, extinguishing powder. Do not use water.*
Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Carbon monoxide and carbon dioxide
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.
Additional information *Cool endangered receptacles with water spray.*

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources
Environmental precautions:
Do not allow to enter sewers/ surface or ground water.
Do not allow to penetrate the ground/soil.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Keep away from ignition sources.
Reference to other sections
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Precautions for safe handling
Ensure good interior ventilation, especially at floor level. (Fumes are heavier than air).
Use solvent-proof equipment.
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Open and handle container with care.
Information about protection against explosions and fires:
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.
Do not distill to dryness.
Explosive peroxides may form, handle container cautiously.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles:
Provide solvent resistant, sealed floor.
Store in a cool location.
Information about storage in one common storage facility: *Store away from oxidizing agents.*
Further information about storage conditions:
Store receptacle in a well ventilated area.
Store at room temperature.

Store in cool, dry conditions in well sealed containers.
Avoid contact with air/oxygen (formation of peroxide).
Check container pressure periodically to prevent explosive peroxides.
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

Components with limit values that require monitoring at the workplace:	
109-99-9 Tetrahydrofuran (100.0%)	
PEL (USA)	590 mg/m³, 200 ppm
REL (USA)	Short-term value: 735 mg/m³, 250 ppm Long-term value: 590 mg/m³, 200 ppm
TLV (USA)	Short-term value: 295 mg/m³, 100 ppm Long-term value: 147 mg/m³, 50 ppm Skin
EL (Canada)	Short-term value: 100 ppm Long-term value: 50 ppm Skin
EV (Canada)	Short-term value: 100 ppm Long-term value: 50 ppm Skin

Ingredients with biological limit values:	
109-99-9 Tetrahydrofuran (100.0%)	
BEI (USA)	2 mg/L Medium: urine Time: end of shift Parameter: Tetrahydrofuran

Additional information:
The exposure limits that were valid when the MSDS was created were used.
No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
Pregnant women should strictly avoid inhalation or skin contact.
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
Breathing equipment:
Use suitable respirator when high concentrations are present.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
Recommended filter device for short term use: Filter AX
Protection of hands:
Impervious gloves
Solvent resistant gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality.
Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:

Form:	Liquid
Formula:	C4H8O
Weight:	72.11

Odor threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	-108°C (-162 °F)
Boiling point/Boiling range:	65-67°C (149-153 °F)
Sublimation temperature / start:	Not determined
Flash point:	-17°C (1 °F)
Flammability (solid, gaseous)	Not applicable.
Ignition temperature:	230°C (446 °F)
Decomposition temperature:	Not determined
Auto igniting:	Not determined.
Danger of explosion:	May form explosive peroxides. May form explosive peroxides. Do not distill to dryness.
Explosion limits:	
Lower:	1.5 Vol %
Upper:	12 Vol %
Vapor pressure at 20°C (68 °F):	200 hPa (150 mm Hg)
Density at 20°C (68 °F):	0.887 g/cm³ (7.402 lbs/gal)
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible
Alcohols:	Partly miscible
Ketones:	Partly miscible
Partition coefficient (n-octanol/water):	Not determined.
Viscosity:	
dynamic at 20°C (68 °F):	0.47 mPas
kinematic:	Not determined.
Other information	No further relevant information available.
Additional information	Fumes are heavier than air

10 Stability and reactivity

Reactivity
Chemical stability
Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions
Forms explosive gas mixture with air
Possible formation of peroxides.
Reacts with oxidizing agents
Reacts with halogenated compounds
Reacts with alkali (lyes)
May form explosive peroxides.
Incompatible materials: No information known.
Hazardous decomposition products:
Irritant gases/vapors
Carbon monoxide and carbon dioxide
Additional information: Avoid loss of stabilizer.

11 Toxicological information

Information on toxicological effects
Acute toxicity:
Primary irritant effect:
on the skin: Irritant to skin and mucous membranes.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Other information (about experimental toxicology):
Mutagenic effects have been observed on tests with bacteria.
Irritating to respiratory system
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
ACGIH A3: Animal carcinogen: Agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by

mechanism(s) not considered relevant to worker exposure. Available epidemologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute and/or other multiple dose toxicity data for components in this product.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive and/or mutation data for components in this product.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for components in this product.

12 Ecological information

Toxicity
Aquatic toxicity: *No further relevant information available.*
Persistence and degradability *No further relevant information available.*
Behavior in environmental systems:
Bioaccumulative potential *No further relevant information available.*
Mobility in soil *No further relevant information available.*
Additional ecological information:
General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.
Results of PBT and vPvB assessment
PBT: *Not applicable.*
vPvB: *Not applicable.*
Other adverse effects *No further relevant information available.*

13 Disposal considerations

Waste treatment methods
Recommendation *Consult state, local or national regulations to ensure proper disposal.*
Uncleaned packagings:
Recommendation: *Disposal must be made according to official regulations.*
Recommended cleansing agent: *Water, if necessary with cleansing agents.*

14 Transport information

UN-Number	
DOT, ADR, IMDG, IATA	*UN2056*
UN proper shipping name	
DOT, IMDG, IATA	*TETRAHYDROFURAN*
ADR	*2056 TETRAHYDROFURAN*
Transport hazard class(es)	
DOT	
	
Class	*3 Flammable liquids.*
Label	*3*
ADR	
	
Class	*3 (F1) Flammable liquids*
Label	*3*

IMDG, IATA	
	
Class	3 Flammable liquids.
Label	3
Packing group	
DOT, ADR, IMDG, IATA	II
Environmental hazards:	
Marine pollutant:	No
Special precautions for user	Warning: Flammable liquids
Danger code (Kemler):	33
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
UN "Model Regulation":	UN2056, TETRAHYDROFURAN, 3, II

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).
Information about limitation of use:
For use only by technically qualified individuals.
This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

Disturbance regulations:
Critical quantity values according to the regulations on accidents should be adhered to.
Other regulations, limitations and prohibitive regulations
Substances of very high concern (SVHC) according to REACH, Article 57
Substance is not listed.
REACH - Pre-registered substances Substance is listed.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information:

The above information is believed to be correct but does not purport to be complete and should be used only as a guide. The burden of safe use of this material rests entirely with the user.

10/10/2013