

Material Safety Data Sheet

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Version 1.2

According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

1 - Product and Company Information

Product Name GAMMA-BUTYROLACTONE, REAGENTPLUS(TM),
 >=99%

Product Number B103608

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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
GAMMA-BUTYROLACTONE	96-48-0	202-509-5	None

Formula C4H6O2

Molecular Weight 86.09 AMU

Synonyms gamma-6480 * Agrisynth BLO * gamma-BL *
 4-Butanolide * 1,2-Butanolide * 1,4-Butanolide *
 Butyric acid, 4-hydroxy-, gamma-lactone *
 Butyric acid lactone * Butyrolactone *
 gamma-Butyrolactone * 4-Butyrolactone *
 Butyrylactone * Butyryl lactone * C-1070 *
 4-Deoxytetronic acid * Dihydro-2(3H)-furanone *
 4-Hydroxybutanoic acid lactone *
 4-Hydroxybutanoic acid, gamma-lactone *
 gamma-Hydroxybutyric acid cyclic ester *
 4-Hydroxybutyric acid lactone * 4-Hydroxybutyric
 acid, gamma-lactone * gamma-Hydroxybutyric acid
 lactone * gamma-Hydroxybutyrolactone *
 NCI-C55878 * 2-Oxolanone * Tetrahydro-2-furanone

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Harmful if swallowed. Irritating to eyes.

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If breathing becomes difficult,
call a physician.

AFTER SKIN CONTACT

In case of contact, immediately wash skin with soap and copious amounts of water.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

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

SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.
Explosion Hazards: Vapor/air mixtures are explosive at high temperatures.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

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

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES 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. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed.

SPECIAL REQUIREMENTS: Hygroscopic.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Clear liquid Color: Colorless	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	204 - 205 °C	760 mmHg
MP/MP Range	-45 °C	
Flash Point	98 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	455 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 1.4 % Upper: 16 %	
Vapor Pressure	1.5 mmHg	20 °C
SG/Density	1.129 g/cm ³	
Partition Coefficient	Log Kow: -0.57	
Viscosity	N/A	
Vapor Density	3 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions of Instability: Hygroscopic.

Materials to Avoid: Strong acids, Strong bases, Strong oxidizing agents, Strong reducing agents, Zinc, Plastics.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: LU3500000

ACUTE TOXICITY

LD50

Oral

Rat

1540 mg/kg

Remarks: Behavioral: Altered sleep time (including change in

righting reflex). Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Respiratory depression.

LC50
Inhalation
Rat
> 5,100 mg/m3
4H

LD50
Intraperitoneal
Rat
1 GM/KG
Remarks: Behavioral:General anesthetic. Lungs, Thorax, or Respiration:Other changes.

LD50
Oral
Mouse
1460 mg/kg
Remarks: Behavioral:General anesthetic. Behavioral:Somnolence (general depressed activity). Lungs, Thorax, or Respiration:Respiratory depression.

LD50
Intraperitoneal
Mouse
1100 MG/KG
Remarks: Behavioral:General anesthetic. Lungs, Thorax, or Respiration:Other changes.

LD50
Skin
Guinea pig
> 5000 mg/kg

IRRITATION DATA

Skin
Rabbit
0.5 ml
Remarks: Severe irritation effect

SIGNS AND SYMPTOMS OF EXPOSURE

Inhalation may have an anesthetic effect on the central nervous system characterized by a loss of sensation. Preliminary excitement is the initial effect followed by relaxation, stupor, or sleep. Exposure can cause: Nausea, dizziness, and headache.

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes eye irritation.
Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: Harmful if swallowed.

TARGET ORGAN INFORMATION

Central nervous system.

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not

classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Mouse

Route of Application: Oral

Exposure Time: 2Y

Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Endocrine: Adrenal cortex tumors.

Mouse

Route of Application: Skin

Exposure Time: 42W

Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors. Tumorigenic: Tumors at site or application.

IARC CARCINOGEN LIST

Rating: Group 3

CHRONIC EXPOSURE - MUTAGEN

Hamster

25 MG/L

Cell Type: kidney

Morphological transformation.

Hamster

2580 MG/L

Cell Type: ovary

Cytogenetic analysis

Hamster

4940 MG/L

Cell Type: ovary

Sister chromatid exchange

CHRONIC EXPOSURE - TERATOGEN

Species: Rat

Dose: 500 MG/KG

Route of Application: Oral

Exposure Time: (6-15D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat

Dose: 25 GM/KG

Route of Application: Oral

Exposure Time: (20D MALE)

Result: Paternal Effects: Testes, epididymis, sperm duct.

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: LC50 Fish

Species: Leuciscus idus

Time: 96 h

Value: > 220 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

Non-hazardous for road transport.

IMDG

Non-hazardous for sea transport.

IATA

Non-hazardous for air transport.

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

INDICATION OF DANGER: Xn

Harmful.

R-PHRASES: 22 36

Harmful if swallowed. Irritating to eyes.

S-PHRASES: 26 36

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 1

SWITZERLAND

SWISS POISON CLASS: 4

16 - Other Information

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 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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