SECTION-1: Identification of the substance / mixture and the company / undertaking

Catalogue Number	CS-O-33594
Product Name	Di-allate
CAS No.	2303-16-4
Category	Pesticide Standards
Synonyms	Not available
Brand	Clearsynth Labs Ltd.
Identified uses	Laboratory Chemicals
Uses advised against	Not available
Company	Clearsynth Labs Ltd. Mumbai, India
Emergency Phone #	+91-22-245045900
REACH No.	Not available

SECTION 2: Hazards identification

Disclaimer: This is sample MSDS. Please email **sales@clearsynth.com** for more details.

2.1 Classification of the substance or mixture-Regulation (EC) No 1272/2008:

Skin irritation (Category 2)
Serious eye damage/eye irritation (Category 2)
Acute toxicity (Category 4)

2.2 Label Elements

Signal Word: Warning

Hazard Statement(s)

Code	Statement
H302	Harmful if swallowed.
H351	Not available

H400	Not available
H410	Not available
H227	Not available
H315	Causes skin irritation.
H319	Causes serious eye irritation.

Precautionary Statement(s)

Code	Statement
P203	Not available
P264	Wash hands thoroughly after handling.
P270	Not available
P273	Not available
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P317	Not available
P318	Not available
P330	Not available
P391	Not available
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulatio
P210	Not available
P264+P265	Not available
P302+P352	IF ON SKIN: Wash with plenty of water and soap.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if presen
P321	Specific treatment (see … on this label).
P332+P317	If skin irritation occurs: Get medical help.
P337+P317	If eye irritation persists: Get medical help.
P362+P364	Take off contaminated clothing and wash it before reuse.
P370+P378	Not available
P403	Not available

SECTION 3: Composition / information on ingredients

3.1 Substance

Component : Di-allate
CAS Number : 2303-16-4
Molecular Formula : C10H17Cl2NOS
Molecular Weight : 270.22
Parent Chemical : Not available
Synonyms : Not available
Concentration : Not available

SECTION 4: First aid measures

Not available

SECTION 5: Firefighting measures

Not available

SECTION 6: Accidental release measures

Not available

SECTION-7: Handling and storage

Not available

SECTION 8: Exposure controls / personal protection

Not available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Test	Result
Appearance	No data available
IR spectrum	No data available
pH	No data available
Solubility	No data available

Property	Value
a) Physical State	No data available
b) Color	No data available
c) Odor	No data available
d) pH	No data available
e) Vapour Pressure	No data available
f) Viscosity	No data available
g) Initial Boiling Point and boiling range	No data available
h) Melting Point / Freezing Point	No data available
i) Auto Ignition Temperature	No data available
j) Flash Point	No data available
k) Explosion Limit, Lower	No data available
l) Explosion Limit, Upper	No data available
m) Decomposition Temperature	No data available
n) Loss on Drying	No data available
o) Relative Density	No data available
p) Solubility (in DMSO)	No data available
q) Oxidizing Properties	No data available

SECTION 10: Stability and reactivity

Not available

SECTION 11: Toxicological information

11.1 Information on toxicological effects
- Acute toxicity: The metabolic products of triallate, diallate and sulfallate appear to be mutagenic or carcinogenic. In particular, the 2-chloro-allyl group is responsible for the mutagenicity of these herbicides. These metabolites likely bind to or disrupt DNA causes base-pair subsitutions. Diallate has been shown to be a carcinogen in mice. Some thiocarbamates (EPTC, Molinate, Pebulate, and Cycloate) share a common mechanism of toxicity, i.e. the inhibition of acetylcholinesterase. An acetylcholinesterase inhibitor suppresses the action of acetylcholine esterase. Because of its essential function, chemicals that interfere with the action of acetylcholine esterase are potent neurotoxins, causing excessive salivation and eye-watering in low doses. Headache, salivation, nausea, vomiting, abdominal pain and diarrhea are often prominent at higher levels of exposure. Acetylcholine esterase breaks down the neurotransmitter acetylcholine, which is released at nerve and muscle junctions, in order to allow the muscle or

organ to relax. The result of acetylcholine esterase inhibition is that acetylcholine builds up and continues to act so that any nerve impulses are continually transmitted and muscle contractions do not stop. Diallate is carcinogenic. Data concerning the effects of thiocarbamates on man are scarce. However, cases of irritation and sensitization have been observed among agricultural workers. Some thiocarbamates, e.g., molinate, have an effect on sperm morphology and, consequently, on reproduction. However, no teratogenic effects have been observed. The results of mutagenicity studies have shown that thiocarbamates containing dichloroallyl groups are highly mutagenic. Some thiocarbamates are acetylcholine esterase inhibitors. Acute exposure to cholinesterase inhibitors can cause a cholinergic crisis characterized by severe nausea/vomiting, salivation, sweating, bradycardia, hypotension, collapse, and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved.

- Skin corrosion/irritation: No data available.
- Serious eye damage/eye irritation: No data available.
- Respiratory or skin sensitization: Diallate is carcinogenic. Data concerning the effects of thiocarbamates on man are scarce. However, cases of irritation and sensitization have been observed among agricultural workers. Some thiocarbamates, e.g., molinate, have an effect on sperm morphology and, consequently, on reproduction. However, no teratogenic effects have been observed. The results of mutagenicity studies have shown that thiocarbamates containing dichloroallyl groups are highly mutagenic. Some thiocarbamates are acetylcholine esterase inhibitors. Acute exposure to cholinesterase inhibitors can cause a cholinergic crisis characterized by severe nausea/vomiting, salivation, sweating, bradycardia, hypotension, collapse, and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved.
- Germ cell mutagenicity: The metabolic products of triallate, diallate and sulfallate appear to be mutagenic or carcinogenic. In particular, the 2-chloro-allyl group is responsible for the mutagenicity of these herbicides. These metabolites likely bind to or disrupt DNA causes base-pair subsitutions. Diallate has been shown to be a carcinogen in mice. Some thiocarbamates (EPTC, Molinate, Pebulate, and Cycloate) share a common mechanism of toxicity, i.e. the inhibition of acetylcholinesterase. An acetylcholinesterase inhibitor suppresses the action of acetylcholine esterase. Because of its essential function, chemicals that interfere with the action of acetylcholine esterase are potent neurotoxins, causing excessive salivation and eye-watering in low doses. Headache, salivation, nausea, vomiting, abdominal pain and diarrhea are often prominent at higher levels of exposure. Acetylcholine esterase breaks down the neurotransmitter acetylcholine, which is released at nerve and muscle junctions, in order to allow the muscle or organ to relax. The result of acetylcholine esterase inhibition is that acetylcholine builds up and continues to act so that any nerve impulses are continually transmitted and muscle contractions do not stop. Diallate is carcinogenic. Data concerning the effects of thiocarbamates on man are scarce. However, cases of irritation and sensitization have been observed among agricultural workers. Some thiocarbamates, e.g., molinate, have an effect on sperm morphology and, consequently, on reproduction. However, no teratogenic effects have been observed. The results of mutagenicity studies have shown that thiocarbamates containing dichloroallyl groups are highly mutagenic. Some thiocarbamates are acetylcholine esterase inhibitors. Acute exposure to cholinesterase inhibitors can cause a cholinergic crisis characterized by severe nausea/vomiting, salivation, sweating, bradycardia, hypotension, collapse, and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved.
- Carcinogenicity: The metabolic products of triallate, diallate and sulfallate appear to be mutagenic or carcinogenic. In particular, the 2-chloro-allyl group is responsible for the mutagenicity of these herbicides. These metabolites likely bind to or disrupt DNA causes base-pair subsitutions. Diallate has been shown to be a carcinogen in mice. Some thiocarbamates (EPTC, Molinate, Pebulate, and Cycloate) share a common mechanism of toxicity, i.e. the inhibition of acetylcholinesterase. An acetylcholinesterase inhibitor suppresses the action of acetylcholine esterase. Because of its essential function, chemicals that interfere with the action of acetylcholine esterase are potent neurotoxins, causing excessive salivation and eye-watering in low doses. Headache, salivation, nausea, vomiting, abdominal

pain and diarrhea are often prominent at higher levels of exposure. Acetylcholine esterase breaks down the neurotransmitter acetylcholine, which is released at nerve and muscle junctions, in order to allow the muscle or organ to relax. The result of acetylcholine esterase inhibition is that acetylcholine builds up and continues to act so that any nerve impulses are continually transmitted and muscle contractions do not stop. The Human Health Assessment Group in EPA's Office of Health and Environmental Assessment has evaluated diallate for carcinogenicity. According to their analysis, the weight-of-evidence for diallate is group C, which is based on limited evidence in animals. No data is available in human. As a group C chemical, diallate is considered to be a possible human carcinogen.
- Reproductive toxicity: Diallate is carcinogenic. Data concerning the effects of thiocarbamates on man are scarce. However, cases of irritation and sensitization have been observed among agricultural workers. Some thiocarbamates, e.g., molinate, have an effect on sperm morphology and, consequently, on reproduction. However, no teratogenic effects have been observed. The results of mutagenicity studies have shown that thiocarbamates containing dichloroallyl groups are highly mutagenic. Some thiocarbamates are acetylcholine esterase inhibitors. Acute exposure to cholinesterase inhibitors can cause a cholinergic crisis characterized by severe nausea/vomiting, salivation, sweating, bradycardia, hypotension, collapse, and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved.
- STOT-single exposure: No data available.
- STOT-repeated exposure: No data available.
- Aspiration hazard: No data available.

Likely routes of exposure
- Measurements of dermal and inhalation exposure of field operators were made during application of the herbicide diallate preemergent to sugar beets. Each operation, tank fill, application and incorporation, was measured individually to assess its relative contribution to the total exposure value. Inhalation exposure was measured by trapping the herbicide on polyurethane foam plugs while sampling the air around the operator's face. Dermal deposition, determined by attaching gauze pads to the operator's clothing and cotton gloves on the hands, was the main contributor to the total exposure.

Symptoms related to the physical, chemical and toxicological characteristics
- Diallate is carcinogenic. Data concerning the effects of thiocarbamates on man are scarce. However, cases of irritation and sensitization have been observed among agricultural workers. Some thiocarbamates, e.g., molinate, have an effect on sperm morphology and, consequently, on reproduction. However, no teratogenic effects have been observed. The results of mutagenicity studies have shown that thiocarbamates containing dichloroallyl groups are highly mutagenic. Some thiocarbamates are acetylcholine esterase inhibitors. Acute exposure to cholinesterase inhibitors can cause a cholinergic crisis characterized by severe nausea/vomiting, salivation, sweating, bradycardia, hypotension, collapse, and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved.

SECTION 12: Ecological information

Not available

SECTION 13: Disposal considerations

Not available

SECTION 14: Transport information

Not available

SECTION 15: Regulatory information

Not available

SECTION 16: Other information

Not available

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