



MATERIAL SAFETY DATA SHEET

Manufacturer/information service:

ZHEJIANG RAYFULL CHEMICALS CO., LTD

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1. Chemical Product Identification

Product Name: Clethodim 95% TC

Molecular Formula: C₁₇H₂₆ClNO₃S

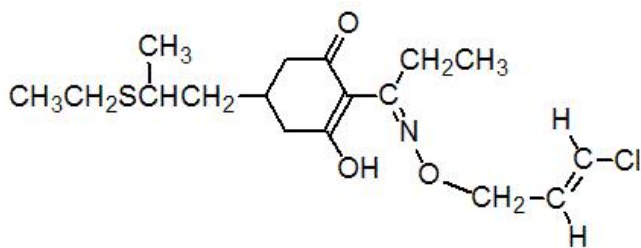
Molecular Weight: 359.92 g/mol

Chemical Name:

(5*RS*)-2-[(*E*)-1-[(2*E*)-3-chloroallyloxyimino]propyl]-5-[(2*RS*)-2-(ethylthio)propyl]-3-hydroxycyclohex-2-en-1-one

CAS number: 99129-21-2

Structural name:



Form: Liquid

Colour: Light yellow

Odour: No characteristic odour

2. Composition / Information On Ingredients

Composition	CAS No.	Content %
Clethodim	99129-21-2	95.0
Other ingredients	---	5.0



3. Hazards Identification

EMERGENCY OVERVIEW: CAUTION. Keep out of reach of children. May irritate skin and eyes. Avoid contact with skin, eyes and clothing. Wash concentrate from skin or eyes immediately. Do not inhale fumes. Avoid breathing vapors or spray mist. After use, wash hands and other exposed skin. When using, do not eat, drink or smoke. Remove and launder contaminated clothing separately from household laundry before reuse. Avoid spray drift. Avoid contamination of ponds, streams, rivers and desirable vegetation. Store the container tightly closed and away from seeds, feeds, fertilizer, plants and foodstuffs. Observe appropriate provincial buffer zones around bodies of water and wetland areas. When handling the concentrate, mixing, loading or during cleanup and repair, wear goggles or face shield, rubber apron, chemically resistant gloves, rubber boots, long sleeved shirt and long legged pants.

4. First Aid Measures

IF SWALLOWED: Call a poison control centre or doctor immediately for treatment advice. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control centre or doctor for treatment advice.

IF INHALED: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing the eye. Call a poison control centre or doctor for treatment advice.

Take the container label or product name and Pest Control Product Registration Number with you when seeking medical attention.

TOXICOLOGICAL INFORMATION: Treat the patient symptomatically. This product contains petroleum distillates. Vomiting may cause aspiration pneumonia.

5. Fire-Fighting Measures

FIRE FIGHTING INSTRUCTIONS: Liquid evaporates and forms vapor (fumes), which can



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catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85°F. Products of combustion from fires involving this material may be toxic. Avoid breathing smoke and mists. Avoid personnel and equipment contact with fallout and runoff. Minimize the amount of water used for fire fighting. Do not enter any enclosed area without full protective equipment, including self-contained breathing equipment. Contain and isolate runoff and debris for proper disposal. Decontaminate personal protective equipment and fire fighting equipment before reuse. Read the entire document.

HAZARDOUS COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen, sulfur. Combustion may produce toxic compounds of chlorine. Incomplete combustion can produce carbon monoxide.

6. Accidental Release Measures

Contact the manufacturer and the provincial regulatory agency in case of a spill, and for cleanup of spills.

FOR SPILLS ON LAND:

CONTAINMENT: Avoid runoff into storm sewers and ditches, which lead to waterways. Contain spilled liquids with dry sorbents.

CLEANUP: Clean up spill immediately. Absorb spill with inert material (such as dry sand or earth), then place in a chemical waste container. Wash the area with soap and water. Pick up wash liquid with additional absorbent and place in a chemical waste container.

FOR SPILLS IN WATER:

CONTAINMENT: This material forms an emulsion in water. Stop or reduce contamination of any water. Isolate contaminated water.

CLEANUP: Remove contaminated water for treatment or disposal.

7. Handling And Storage

END USER MUST READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

PRECAUTIONS TO BE TAKEN IN HANDLING: Shake well before using. After use, wash hands and other exposed skin. When using, do not eat, drink or smoke. Remove and launder contaminated clothing separately from household laundry before reuse. Avoid spray drift.



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When handling the concentrate, mixing, loading or during cleanup and repair, wear goggles or face shield, rubber apron, chemically resistant gloves, rubber boots, long sleeved shirt and long legged pants.

PRECAUTIONS TO BE TAKEN IN STORAGE: May be stored at any temperature. Insecticides and fungicides should be segregated from herbicides so as to prevent the possibility of cross-contamination.

STORAGE TEMPERATURE (MIN/MAX): Normal ambient temperatures.

8. Exposure Controls/Personal Protection

EYE PROTECTION: Appropriate eye protection must be worn when working with this material or serious harm can result. Wear protective eyewear.

RESPIRATORY/VENTILATION: This material may be a respiratory irritant and, unless ventilation is adequate, the use of approved respiratory protection is recommended. Use this material only in well-ventilated areas.

SKIN PROTECTION: Do not get on skin or clothing. Skin contact should be avoided by wearing protective clothing including chemical resistant gloves, long sleeved shirt, long pants, shoes and socks. Discard clothing and other absorbent materials that may have been drenched or heavily contaminated with this product's concentrate.

Do not reuse them.

USER SAFETY RECOMMENDATIONS:

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

EXPOSURE GUIDELINES: Refer to Section 2.

ENGINEERING CONTROLS: Use adequate ventilation to minimize airborne concentrations of this material.

9. Physical And Chemical Properties

Appearance: Light yellow liquid

pH: 4.0-6.0



Water: $\leq 0.2\%$

Acetone insoluble: $\leq 0.1\%$

10. Stability And Reactivity

STABILITY: Stable under testing methods (54°C for 14 days).

INCOMPATIBILITY: Incompatible with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

OXIDATION/REDUCTION PROPERTIES: Not an oxidizing agent; mild reducing agent.

HAZARDOUS COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen, sulfur. Combustion may produce toxic compounds of chlorine. Incomplete combustion can produce carbon monoxide.

11. Toxicological Information

Acute oral LD50 for rat: 1133 a.i.mg/kg.

Acute dermal LD50 for rabbit: >4167 a.i.mg/kg.

Inhalation LC50 (4 h) for rat: <3.25 mg/L a.i.mg/L.

Skin irritation: Moderate skin irritant (rabbits).

Eye irritation: Not irritant to eyes (rabbits).

Skin Sensitization: Non-sensitive (Guinea Pig)

12. Ecological And Ecotoxicological Information

Effect on birds: moderate toxicity to birds, acute LD50 for Bobwhite quail is >1640 a.i.mg/kg.

Effect on fish: moderate toxicity to fish, acute 96 hour LC50 for Rainbow trout is 25 a.i.mg/L.

Effect on aquatic invertebrates: low toxicity to aquatic invertebrates, acute 48 hour EC50 for Daphnia magna is >100 a.i.mg/L.

Effect on algae: low toxicity to algae, acute 72 hour EC50 for Pseudokirchneriella subcapitata is >12.0 a.i.mg/L.

Effect on honeybees: moderate toxicity to honeybees, contact acute 48 hour LD50 is >51 a.i.µg/bee, oral acute 48 hour LD50 is >43 a.i.µg/bee.

Effect on earthworms: moderate toxicity to earthworms, acute 14 day LC50 is 454 a.i.mg/kg.



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13. Disposal Considerations

PRODUCT DISPOSAL: For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of spill, and for cleanup of spills.

CONTAINER DISPOSAL: Dispose of product containers, waste containers, and residues according to label instructions and provincial requirements.

14. Transport Information

Not applicable.

15. Regulatory Information

Not applicable.

16. Other Information

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the PRODUCT AS SUCH. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.