Material Safety Data Sheet

Tebuconazole TC

1. Chemical Product and Company Identification

MSDS Name: Tebuconazole Technical
Company Identification: SHANGHAI TENGLONG AGROCHEM CO., LTD.
For information, call: 0086-21-5506 3225
Emergency Number: 0086-21-5506 3699

2. Composition, Information on Ingredients

Components | CAS Number | (% Purity)
--- | --- | ---
Tebuconazole | 107534-96-3 | 95 Min.
Other ingredients | | 5 Max.

Structural formula:

![Structural formula](image)

Molecular formula: C₁₆H₂₂ClN₃O
Molecular Weight: 307.8

Chemical Abstracts name: 
(±)-α-[2-(4-chlorophenyl)ethyl]-α-(1,1-dimethylethyl)-1H-1,2,4-triazol-1-ethanol

IUPAC name: 2-p-chlorophenyl-2-(1H-1,2,4-triazol-1-ylmethyl)hexaneutriile

3. Hazards Identification

Main hazards: the product may be toxic to men and to the environment if not used as recommended.

Product Effects:
Adverse health effects to man: It may cause skin, eyes and respiratory irritation.
Environmental Effects: It is toxic to aquatic microorganisms, algae, fish, bees and fauna.
Specific hazards: There are no other hazards related to the product.

Main Symptoms: High concentration inhalation may cause nasal, throat and respiratory tracts irritation. The ingestion of large amounts may cause abdominal discomfort or pain, nausea, vomiting, dizziness and blurred vision.

4. First Aid Measures

First Aid Measures: Remove to fresh air. Remove all contaminated clothing and wash the affected parts of the body thoroughly with plenty of water and soap during 30 minutes. If victim is unconscious and not breathing, apply artificial respiration or oxygenation. Take victim to the nearest medical care center with this sheet,
Inhalation: Remove to fresh air. If stop breathing, apply artificial respiration. If breathing is difficult, immediately call a physician.

Skin contact: Immediately wash with water and soap during 30 minutes after removing contaminated clothing. In case of effects/symptoms, call a physician. Wash the contaminated clothing prior to reuse them and dispose contaminated shoes.

Eyes contact: Immediately flush with running water for at least 30 minutes. Call a physician.

Ingestion: Do not induce vomiting, but do not stop if it happens spontaneously. Immediately call a physician.

Actions to be avoided: Do not apply mouth to mouth respiration if the patient has swollen the product. Give artificial respiration.

Protection for the first aid givers: Avoid skin or inhalation contact with the product during the process.

Notes for the physician: No specific antidote is available. If large amount was swallowed, gastric emptying procedures as gastric lavage may be performed, taking great care to avoid pulmonary aspiration due to the risk of chemical pneumonitis. Activated charcoal and saline laxatives may be administered due to probable active ingredients adsorption to activated charcoal. Symptomatic treatment must include, specially, support measures as the correction of hydro electrolytic and metabolic disorders, as well as respiratory aid. The management of hepatic and renal functions must be kept. If in eye, rinse with physiological saline followed by occlusion and lead to ophthalmic evaluation.

5. Fire Fighting Measures

Extinguishing media: Foam, CO₂, dry chemical and, in last case, water spray.

Special Procedures: Wear appropriate PPE (personal protective equipment) to avoid direct contact with the product. PVC overall, rubber gloves and rubber boots are recommended. Wear self-contained breathing apparatus.

6. Accidental Release Measures

Personal precautions: Wear waterproof overalls, safety goggles, rubber boots and nitrile rubber or PVC gloves. Respiratory protection must be used depending on the concentrations in the environment or on the extension of the spill/release. In this case, choose self-contained breathing apparatus.

Removal of ignition sources: Stop electric energy and turn off the sources that may produce sparks. Remove all the material that may start a fire (e.g. spilled diesel oil).

Dust control: Isolate and signal the contaminated area. Cover the spill with plastic sheet or spray water on the powder.

Inhalation, skin, mucous membrane and eyes contact prevention: Wear the garments and accessories described above.

Environmental precautions: Avoid contamination of surface waters sealing the entrance of the rain water galleries (culverts). Do not allow the residues of the released product reach water collections.

Cleaning methods: Stop and collect the spill. Put the residues into a recipient for disposal according to the local regulations. Clean, preferably with a detergent; avoid using solvents.

Secondary hazards prevention: Do not allow the product contaminate creeks, lakes, water
fountains, wells, sewers, pluvial sewers and effluents.

7. Handling and Storage

Handling:

Technical measures: Wear PPE as described on item 8. Keep people, and specially children and domestic animals away from the place of work. Do not have direct contact with the product.

Workers exposure prevention: wear PPE as described on item 8. Do not eat, drink or smoke during product handling. When opening a packaging, do it in a way to avoid leaks. Do not use damaged/defective personal protective and application equipment. Do not manipulate and/or carry damaged packaging.

Safe handling precautions: Wear PPE as described on item 8.

Guidance to a safe handling: Wear PPE as described on item 8. Handle the product with appropriate local exhaustion or in a well ventilated area. If handled in open environments, do it in the same direction as of wind. In case of intoxication symptoms, immediately stop the work and proceed as described on item 4 of this sheet.

Storage

Appropriate technical measures: Keep the product in its original recipient. Keep eventual residues of the product in its original packaging, appropriately closed.

Storage conditions

Appropriate: Keep the recipient appropriately closed, at room temperature and protected from light. Keep it in a duly identified, exclusive place for toxic products. Lock the place to avoid the access of unauthorized persons and children.

Avoid: Humid places and places with sources of heat.

Incompatible products and materials: do not store with food, beverages, including those intended for animal use. Safe materials for packaging

Recommended: Product already packed in an appropriate packaging

8. Exposure Controls, Personal Protection

Engineering controls: Whenever applicable use ventilators, air circulators, exhausters appropriate to gases and vapors; provide the work area with appropriate ventilation. The operator must always use breathing protective equipment, even when there is a good natural or mechanical ventilation.

Specific control parameters:

Occupational exposure limits:

<table>
<thead>
<tr>
<th>Common name</th>
<th>Exp. Limit Type</th>
<th>Effect</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tebuconazole</td>
<td>None established</td>
<td>TLV/TWA</td>
<td>NR 15, 1994 and ACGIH, 2002</td>
</tr>
</tbody>
</table>

Biological indicators:

<table>
<thead>
<tr>
<th>Common name</th>
<th>Exp. Limit Type</th>
<th>Effect</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tebuconazole</td>
<td>None established</td>
<td>BEI</td>
<td>ACGIH, 2002</td>
</tr>
</tbody>
</table>

Recommended monitoring procedure: Perform tests of hepatic and renal functions, product detection in collected vomiting or washed skin. Check the product dosage in the blood.

Personal protective equipment:
Breathing protection: Wear masks with chemical filter for organic vapors, acid gases and pesticides combined with mechanical filter for particles.

Hands protection: Wear nitril rubber, PVC or other waterproof material gloves.

Eye protection: Wear safety goggles for chemical products.

Skin and body protection: Wear long sleeve waterproof or hydro-repellent overalls and PVC boots.

Special Precautions: Keep PPE duly clean and in adequate use conditions, performing inspections, sanitization and possible maintenance and/or substitution of damaged/defective equipment and parts from time to time.

Hygiene measures: Take shower and change the clothing after using the product. Wash contaminated clothing separately, avoiding its contact with another personal use tools.

<table>
<thead>
<tr>
<th>9. Physical and Chemical Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form:</strong> Crystals</td>
</tr>
<tr>
<td><strong>Color:</strong> White</td>
</tr>
<tr>
<td><strong>Odor:</strong> Characteristic</td>
</tr>
<tr>
<td><strong>PH:</strong> Not determined</td>
</tr>
<tr>
<td><strong>Boiling point:</strong> Not applicable as it is solid</td>
</tr>
<tr>
<td><strong>Melting point:</strong> 102.4℃</td>
</tr>
<tr>
<td><strong>Flash point:</strong> Not applicable</td>
</tr>
<tr>
<td><strong>Upper/lower explosion limits:</strong> The product is not explosive</td>
</tr>
<tr>
<td><strong>Density:</strong> 1.25 (26℃)-Pesticide Man.</td>
</tr>
<tr>
<td><strong>Solubility:</strong> At 20℃; in water 0.036 g/l; in n-hexane &lt; 0.1 g/L, in dichloromethane &gt; 200 g/L; 2-propanol, toluene 50-100 g/L.</td>
</tr>
<tr>
<td><strong>Partitioning coefficient oil/water:</strong> Kow Log P = 3.7 (20℃)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. Stability and Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical stability:</strong> The product is stable under normal temperature and storage conditions.</td>
</tr>
<tr>
<td><strong>Hazardous reactions:</strong> There is no hazardous reaction known.</td>
</tr>
<tr>
<td><strong>Hazardous decomposition products:</strong> Fire produces carbon monoxide, carbon dioxide, nitrous oxide, chlorides and other non-identifiable organic substances.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. Toxicological Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute toxicity:</strong></td>
</tr>
<tr>
<td>Oral LD$_{50}$ in rats: &gt; 2,000 mg/kg</td>
</tr>
<tr>
<td>Dermal LD$_{50}$ in rats: &gt; 2,000 mg/kg</td>
</tr>
<tr>
<td>Inhaling LC$_{50}$: &gt; 2.04 mg/L</td>
</tr>
<tr>
<td><strong>Local Effects:</strong></td>
</tr>
<tr>
<td>Skin irritation in rabbits: The product is considered none irritating.</td>
</tr>
<tr>
<td>Eye irritation rabbits: The product is considered none irritating</td>
</tr>
<tr>
<td><strong>Chronic toxicity:</strong></td>
</tr>
<tr>
<td>Mutagenicity: The product is considered non-mutagenic.</td>
</tr>
<tr>
<td>Carcinogenicity: The active ingredient is considered non-carcinogenic.</td>
</tr>
<tr>
<td>Teratogenicity: The active ingredient is considered non-teratogenic.</td>
</tr>
</tbody>
</table>
Reproductive effects: The active ingredient is considered as having no reproductive effect.

12. Ecological Information

Environmental, behavioral effects and impact of the product:
Persistence/Degradability: under field conditions, the active ingredient degraded much more rapidly, and did not accumulate in long-term studies.
Bioaccumulation: the active ingredient was classified as none bioaccumulative since the metabolites detected in wheat, peanut and grapes were mainly triazole containing compounds of no toxicological relevance.
Ecotoxicological information:
Toxicity to fish: LC50 (96 hs) = 7.48 mg/L
Toxicity to birds: LD50 > 2,000 mg/Kg
Toxicity to aquatic microorganisms: EC50 (48 hs)= 10.60 mg/L
Toxicity to algae: (Chlorella vulgaris) EC50 (96 hs)= 1.47 mg/L
Toxicity to microcrustaceous (Daphnia spp): EC50 (48 hs) = 10.60 mg/L
Toxicity to bees: LD50 (24 hs) = 3.47 μg/bee
Toxicity to fauna: (Bob white) LD50 = 4,488 mg/kg a.i.

13. Disposal Considerations

Treatment and disposal methods:
Product: Inactivate the product through incineration in ovens designed to this kind of operation, equipped with chambers to wash effluent gases that are according to the competent authority regulations.
Product residues: Keep eventual residues of the product and/or products with expiration date expired in their original packaging, duly closed.
Used packaging: The empty packaging must be stored in a covered, ventilated place, protected from the rain and with waterproof floor, as well as contention dikes. Wear gloves when handling these packaging. The final destination of empty packaging can only be done by registering Company or user company or companies legally authorized by the competent authorities. The reuse of the empty packaging is forbidden for the user. They may be recycled if appropriate legislation is obeyed.

14. Transport Information

National and international regulations:
THE PRODUCT IS NOT CLASSIFIED AS DANGEROUS GOODS.

15. Regulatory Information

Regulations:
Information on risk and safety according to the label:
Avoid eyes, skin or clothing contact with the product.
Avoid inhale vapors or mixtures.
Handle the product only under appropriate ventilation
Store in an appropriate packaging, duly closed.
Immediately remove and wash contaminated clothing.
Do not eat, drink or smoke during product handling.
When opening a packaging, do it in a way to avoid leaks.
Do not use damaged and/or defective PPE and applying equipment.
Do not wash packaging in lakes, fountains, rivers and other water courses. Avoid water contamination.
Discard the packaging and residues of the product correctly.

### 16. Additional Information
This MSDS summarizes our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace including in conjunction with other products. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company. Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available on request.