



Hangzhou Tianlong Biotechnology Co., Ltd.

Add: Room 1906, Fengqi Times Tower, No.338, Fengqi East Road, Hangzhou, Zhejiang, China.

## MATERIAL SAFETY DATA SHEET

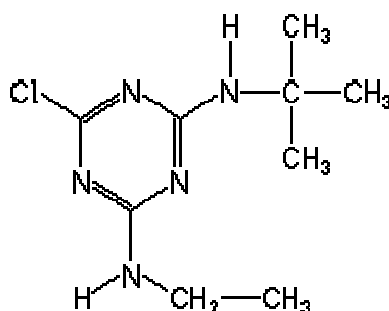
### 1. Chemical Product and Company Identification

Product Name: Terbutylazine

Molecular Formula: C<sub>9</sub>H<sub>16</sub>ClN<sub>5</sub>

Molecular Weight: 229.71

Structural Formula:



Chemical Name: N<sub>2</sub>-tert-butyl-6-chloro-N<sub>4</sub>-ethyl-1,3,5-triazine-2,4-diamine

CAS No.: 5915-41-3

Supplier: HANZHOU TIANLONG BIOTECHNOLOGY CO., LTD

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### 2. Composition / Information On Ingredients

Composition	CAS No.	Content %
Terbutylazine	5915-41-3	98.0
Others ingredients		2.0

### 3. Hazards Identification

Primary route of entry: Inhalation, absorption skinning contact.

EYE: May cause slight irritation.

SKIN: A single, prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. Prolonged or repeated skin contact may cause irritation.

INHALATION: No known hazards in normal industrial use. Avoid breathing vapors or mists. Prolonged or excessive inhalation may cause coughing or sneezing.

INGESTION: Slightly toxic if swallowed.

CHRONIC EFFECTS: Animals studies indicated effects on the liver, testes, thymus and stomach when product was applied dermally.

CARCINOGENICITY INFORMATION:

No known cancer hazards.

#### MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

The health hazards of this product should be low under normal industrial and commercial uses.

#### 4. First Aid Measures

Eyes: Hold eyes open, flood with water for at least 15 minutes. Seek medical advice.

Skin: Remove contaminated clothing and wash skin thoroughly with soap and water.

Ingestion: Do not give anything by mouth to an unconscious person. Give a glass or two of water and induce vomiting by putting a finger down the throat. Repeat until vomit fluid is clear in appearance. Seek medical assistance immediately. advice.

#### 5. Fire-Fighting Measures

##### EXTINGUISHING MEDIA:

Water, carbon dioxide, foam or dry powder.

##### FIRE & EXPLOSION HAZARDS:

When water has evaporated, the residue will burn. No known unusual hazards in a fire/explosion situation.

##### FIRE FIGHTING INSTRUCTIONS:

As in any fire, wear self-contained breathing apparatus pressure-demand MSHA/NIOSH (approved or equivalent) and full protective gear. Containers can build up pressure if exposed to heat (fire). Dike and collect water used to fight fire. Contaminated extinguishing water must be disposed of in accordance with applicable regulations.

##### COMBUSTION PRODUCTS:

In the case of a fire, oxides of carbon, nitrogen and sulfur may be produced along with fumes and smoke.

#### 6. Accidental Release Measures

##### SAFEGUARDS (PERSONNEL):

Wear appropriate personal protective equipment. Eliminate all sources of ignition - heat, sparks, flame, electricity, impact and friction. Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Exposure Controls/Personal Protection. Contain liquid to prevent further contamination of soil, surface water or groundwater.

##### INITIAL CONTAINMENT:

Contain spilled material. Absorb spills with inert material. Solutions extremely slippery when spilled.

##### LARGE SPILLS PROCEDURE:

Contain spilled liquid with sand or earth. Avoid runoff into storm sewers and ditches which lead to waterways. Treat or dispose of waste material in accordance with all local, state/provincial, and national requirements.

##### SMALL SPILLS PROCEDURE:

Clean up area by absorbent material.

#### 7. Handling And Storage

Handling practices: KEEP OUT OF REACH OF CHILDREN and animals.

Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Avoid breathing vapors or spray mist. Wear full protective clothing and equipment (see Section 8). After work, rinse gloves and remove protective equipment, and wash hands thoroughly with soap and water after handling, and before eating, tobacco use, drinking, or using the toilet. Wash contaminated clothing before re-use and separate from household laundry. Keep containers closed when not in use. Keep product, wash or rinse water, and contaminated materials out of water, away from crops, and away from access by people, animals and birds.

## 8. Exposure Controls/personal protection

Personal Protective Equipment:

To avoid eye and skin contact, wearing the following personal protective clothing and equipment is recommended:

Eyes: Safety goggles or face shield

Clothing: Cotton overalls buttoned to the neck and wrist and a washable hat.

Gloves: Elbow length PVC gloves.

Respiratory: Respiratory protection is not normally required. If airborne concentrations are likely to exceed the exposure standard above, an AS/NZS 1715/1716 approved respirator should be worn.

Other: After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water. After each day's use wash gloves, goggles or face shield and contaminated clothing.

## 9. Physical And Chemical Properties

Appearance: Gray white powder

Odor: N/A

PH: 6.0 to 9.0

Vapor pressure and reference temperature: 0.15 mPa (25 °C)  
(TERBUTHYLAZINE Technical).

Vapor density: Not available.

Boiling point: Decomposes on distillation..

Melting point: 177-179 °C.

Specific gravity or density: 1.188 g/mL @ 25°C

Evaporation Rate: Not available.

Water/oil partition coefficient: Not available.

Odour threshold: Not available.

F.p. >150 °C

Solubility in Water: In water 8.5 mg/l (pH 7, 20 °C). In acetone 41, ethanol 14, n-octanol 12, n-hexane 0.36 (all in g/l, 25 °C).

## 10. Stability And Reactivity

Chemical stability: Very stable in storage; store above 5 °C and below 130 °C. Stable to acids and alkalis. Slowly decomposed by light. DT50 in water <21 d.

Conditions to avoid: Unstable under highly alkaline conditions. High temperatures, sparks, open flames. Keep away from sources of ignition.

Incompatibility with other materials: Strong oxidizing agents. Unstable under highly alkaline conditions.

Hazardous decomposition products: Mists from heated solution may cause

respiratory irritation. Thermal decomposition products are toxic and may include hydrocarbons, oxides of carbon, nitrogen and fluorine compounds. Hazardous polymerization: Will not occur. Stable in neutral, weakly acidic and weakly alkaline media; hydrolysed in acidic or alkaline media; DT50 (20 °C) (calc.) 8 d (pH 1), 12 d (pH 13). In natural sunlight, DT50 >40 d.

## **11. Toxicological Information**

#### Acute toxicity/Irritation Studies (TC):

Ingestion: Slightly Toxic  
Oral (LD50 Rat): >1590-2000 mg/kg  
Dermal: >6000 mg/kg  
Dermal (LD50 Rabbit): > 2,000 mg/kg body weight  
Inhalation (LC50 Rat): LC50 for rats 5.3mg/l.  
Eye Contact: Non-irritating  
Skin Contact: Non irritating  
Skin Sensitization: Not a Sensitizer (Guinea Pig)

#### Reproductive/Developmental Effects

##### TERBUTHYLAZINE Technical:

In a 3-generation reproductive study in rats, effects included reductions in weight gain, fetal weight, ossification, testicular weight, spleen weight, increased prostate weight and gestation length. No Effect Level (NOEL) was 1 mg/kg/day. Fetotoxic effects seen in the rabbit, including reduced fetal weight and reduced ossification at higher doses. The NOEL was 30 mg/kg/day in rabbits. The NOEL for teratogenic effects is at least 10/mg/day in the rat, with diaphragmatic hernia at higher doses. Not teratogenic at highest dose tested in rabbits (90 mg/kg/day). While TERBUTHYLAZINE is fetotoxic when fed to pregnant rats, human exposure data has concluded that female formulation workers are not at increased risk of fetotoxic effects when skin protection measures are applied.

#### Chronic/Subchronic Toxicity Studies

##### TERBUTHYLAZINE Technical:

Chronic toxicity studies in rodents have shown liver changes (cellular hypertrophy).

The NOEL in rats is 10 ppm (0.5 mg/kg/day). Long term feeding studies in dogs produced a range of potentially serious effects at high dose rates (red cell, bone marrow and lymphadenopathy changes and liver and spleen damage) with a NOEL of 25 mg/kg/day. No specific neurotoxicity tests have been conducted on fluazifop-p-butyl. However, there was no evidence of neurotoxicity in acute, subchronic or chronic studies.

#### Carcinogenicity

##### TERBUTHYLAZINE Technical:

Laboratory studies show no evidence that TERBUTHYLAZINE is a carcinogen. Specific rat and mouse lifetime studies on fluazifop butyl (a related compound) showed no carcinogenic effects (highest doses 250 ppm rat and 80 ppm mouse).

#### Other Toxicity Information:

In humans, TERBUTHYLAZINE is rapidly metabolized to fluazifop (the acid product of metabolism) and eliminated in urine. Converted fluazifop does not accumulate in the body. It penetrates very slowly through human skin. Large doses of TERBUTHYLAZINE may cause reproductive/teratogenic/embryotoxicity effects based on studies in laboratory animals. There is no evidence of mutagenic potential. It is our belief that, under conditions of normal occupational exposure, this product should not pose such a hazard to the worker.

#### Target Organs

#### Active Ingredient

TERBUTHYLAZINE Technical: Liver, skin, kidney, eye, bone marrow, blood,

reproductive system.

## 12. Ecological Information

TERBUTHYLAZINE Technical, is practically non-toxic to insects (bees), but is slightly toxic to birds and toxic to fish and aquatic invertebrates (water flea).

Eco-Acute Toxicity

TERBUTHYLAZINE Technical:

Bees LC50/EC50 (contact) LD50 (topical) >101.2 g/bee

Invertebrates (Water Flea) LC50/EC50 (48 hr) 7.9 ppm

Fish (Trout) LC50/EC50 (96 hr) 5.0 ppm

Fish (Bluegill) LC50/EC50 (96 hr) 7.5 ppm

Birds (8-day dietary - Bobwhite Quail) LC50/EC50 >1,000 ppm

Birds (8-day dietary - Mallard Duck) LC50/EC50 >5,620 ppm

Eco-Chronic Toxicity

TERBUTHYLAZINE Technical: Not Available

Environmental Fate

Animals: In mammals, following oral administration, 72-84% is eliminated in the urine and faeces within 24 h, and almost all within 48 h. A de-ethyl metabolite forms rapidly, followed by conjugates of products formed by oxidation of one methyl group of the tert-butyl moiety. All are rapidly excreted.

Plants: Triazine-tolerant plants (e.g. maize) rapidly de-chlorinate terbuthylazine to hydroxy-terbuthylazine. Various amounts of de-ethylated and hydroxy de-ethylated metabolites are produced, depending on the plant species.

Soil/Environment: Adsorption on soils is strong: Koc 162-278, Kd 2.2-25 are typical values for light agricultural soils. Terbuthylazine is only slightly mobile. Microbial degradation proceeds mainly by de-ethylation and hydroxylation, with eventual ring cleavage. DT50 30-60 d in biologically active soil.

## 13. Disposal Considerations

Waste disposal information: Do not reuse empty containers. Empty container retains product residue. Triple rinse, or equivalent, empty container, return rinse water to dilution mixture, and dispose of dilution mixture as a hazardous waste if it cannot be disposed of by use according to label instructions.

Dispose of empty containers in accordance with local regulations. Consult provincial environment ministry for advice on waste disposal.

Industrial/commercial waste may be handled at licensed facilities only. Waste shipments must be securely packaged and properly labelled. Only licensed carriers may be used, and proper documents must accompany the shipment.

## 14. Transport Information

UN No.: 3077

Class: 9

Packing group: III

## 15. Regulatory Information

According to country-specific requirements either the content of terbuthylazine

and related compounds or the content of terbuthylazine shall be declared.

#### **16. Other 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.