SECTION 1: Identification

1. Product identifier
   Identification of the substance: Thiazolyl blue
   Article number: 4022
   Registration number (REACH): This information is not available.
   EC number: 206-069-5
   CAS number: 298-93-1

1.2 Relevant identified uses of the substance or mixture and uses advised against
   Identified uses: laboratory chemical

1.3 Details of the supplier of the safety data sheet
   Carl Roth GmbH + Co KG
   Schoemperlenstr. 3-5
   D-76185 Karlsruhe
   Germany
   Telephone: +49 (0) 721 - 56 06 0
   Telefax: +49 (0) 721 - 56 06 149
   e-mail: sicherheit@carlroth.de
   Website: www.carlroth.de
   Competent person responsible for the safety data sheet: Department Health, Safety and Environment
   e-mail (competent person): sicherheit@carlroth.de

1.4 Emergency telephone number
   Emergency information service: Poison Centre Munich: +49/(0)89 19240

SECTION 2: Hazard(s) identification

2. Classification of the substance or mixture
   Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

   Classification acc. to GHS

<table>
<thead>
<tr>
<th>Section</th>
<th>Hazard class</th>
<th>Hazard class and category</th>
<th>Hazard statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.2</td>
<td>skin corrosion/irritation</td>
<td>(Skin Irrit. 2)</td>
<td>H315</td>
</tr>
<tr>
<td>A.3</td>
<td>serious eye damage/eye irritation</td>
<td>(Eye Irrit. 2A)</td>
<td>H319</td>
</tr>
<tr>
<td>A.5</td>
<td>germ cell mutagenicity</td>
<td>(Muta. 2)</td>
<td>H341</td>
</tr>
<tr>
<td>A.8R</td>
<td>specific target organ toxicity - single exposure (respiratory tract irritation)</td>
<td>(STOT SE 3)</td>
<td>H335</td>
</tr>
</tbody>
</table>
2.2 Label elements

Labelling acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Signal word  Warning

Pictograms

Hazard statements

H315  Causes skin irritation
H319  Causes serious eye irritation
H335  May cause respiratory irritation
H341  Suspected of causing genetic defects (if exposed)

Precautionary statements

Precautionary statements - prevention
Avoid breathing dust/fume/gas/mist/vapors/spray.
Wear protective gloves/eye protection/face protection.

Precautionary statements - response
IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a POISON CENTER/doctor if you feel unwell.

Precautionary statements - storage
Store in a well-ventilated place. Keep container tightly closed.

Precautionary statements - disposal
Dispose of contents/container to industrial combustion plant.

For professional users only
Labelling of packages where the contents do not exceed 125 ml
Signal word: Warning
Symbol(s)

H319  Causes serious eye irritation.
H341  Suspected of causing genetic defects (if exposed).

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other hazards
There is no additional information.
SECTION 3: Composition/information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazoli-um bromide</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC number</td>
<td>206-069-5</td>
</tr>
<tr>
<td>CAS number</td>
<td>298-93-1</td>
</tr>
<tr>
<td>Molecular formula</td>
<td>C₁₈H₁₆BrN₅S</td>
</tr>
<tr>
<td>Molar mass</td>
<td>414.3 g/mol</td>
</tr>
</tbody>
</table>

SECTION 4: First-aid measures

4.1 Description of first-aid measures

General notes
Take off contaminated clothing.

Following inhalation
Provide fresh air. In case of respiratory tract irritation, consult a physician.

Following skin contact
Rinse skin with water/shower. In case of skin irritation, consult a physician.

Following eye contact
Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. In case of eye irritation consult an ophthalmologist.

Following ingestion
Rinse mouth immediately and drink plenty of water. Call a physician.

4.2 Most important symptoms and effects, both acute and delayed
Irritation, Cough, Breathing difficulties, Nausea, Vomiting

4.3 Indication of any immediate medical attention and special treatment needed
none

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
Co-ordinate fire-fighting measures to the fire surroundings
water spray, foam, dry extinguishing powder, carbon dioxide (CO2)

Unsuitable extinguishing media
water jet
Combustible.
In case of fire may be liberated: nitrogen oxides (NOx), carbon monoxide (CO), carbon dioxide (CO2), sulphur oxides (SOx), hydrogen bromide (HBr).

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products
In case of fire may be liberated: nitrogen oxides (NOx), carbon monoxide (CO), carbon dioxide (CO2), sulphur oxides (SOx), hydrogen bromide (HBr)

5.3 Advice for firefighters
Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Do not breathe dust. Avoid contact with skin and eyes. Use personal protective equipment as required.

6.2 Environmental precautions
Keep away from drains, surface and ground water.

6.3 Methods and material for containment and cleaning up

Advises on how to contain a spill
Covering of drains.

Advises on how to clean up a spill
Take up mechanically. Control of dust. Provide adequate ventilation.

Other information relating to spills and releases
Place in appropriate containers for disposal.

6.4 Reference to other sections

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Avoid dust formation. Provide adequate ventilation. Avoid exposure.

• Measures to prevent fire as well as aerosol and dust generation
Removal of dust deposits.

Advice on general occupational hygiene
Wash hands before breaks and after work.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed. Store in a dry place. May cause decomposition by long-term light influence.

Incompatible substances or mixtures
Observe compatible storage of chemicals.
**Consideration of other advice**

- **Ventilation requirements**
  Use local and general ventilation.

- **Specific designs for storage rooms or vessels**
  Recommended storage temperature: 15 – 25 °C.

### 7.3 Specific end use(s)

No information available.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### National limit values

**Occupational exposure limit values (Workplace Exposure Limits)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of agent</th>
<th>CAS No</th>
<th>Notation</th>
<th>Identifier</th>
<th>TWA [mg/m³]</th>
<th>STEL [mg/m³]</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>particulates not otherwise regulated (PNOR)</td>
<td></td>
<td>i, dust</td>
<td>PEL</td>
<td>15</td>
<td></td>
<td>29 CFR 1910.1000</td>
</tr>
<tr>
<td>US</td>
<td>particulates not otherwise regulated (PNOR)</td>
<td></td>
<td>partml, r, dust</td>
<td>PEL</td>
<td>5</td>
<td></td>
<td>29 CFR 1910.1000</td>
</tr>
</tbody>
</table>

**Notation**

- *dust*  
  As dust

- *i*  
  Inhalable fraction

- *partml*  
  Particles/ml

- *r*  
  Respirable fraction

- *STEL*  
  Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period unless otherwise specified

- *TWA*  
  Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average

### 8.2 Exposure controls

#### Individual protection measures (personal protective equipment)

- **Eye/face protection**
  Use safety goggle with side protection.

- **Skin protection**
  - **hand protection**
    Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.
  - **type of material**
    NBR (Nitrile rubber)
**Thiazolyl blue ≥ 98%, for biochemistry**

**article number: 4022**

- **material thickness**
  >0,11 mm

- **breakthrough times of the glove material**
  >480 minutes (permeation: level 6)

- **other protection measures**
  Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

**Respiratory protection**

Respiratory protection necessary at: Dust formation. Particulate filter device (EN 143). P2 (filters at least 94 % of airborne particles, color code: White).

**Environmental exposure controls**

Keep away from drains, surface and ground water.

---

### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

**Appearance**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>solid (powder)</td>
</tr>
<tr>
<td>Color</td>
<td>dark yellow</td>
</tr>
<tr>
<td>Odor</td>
<td>odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
</tbody>
</table>

**Other physical and chemical parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH (value)</td>
<td>This information is not available.</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>190 – 210 °C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>This information is not available.</td>
</tr>
<tr>
<td>Flash point</td>
<td>not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>no data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>These information are not available</td>
</tr>
</tbody>
</table>

**Explosive limits**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>• lower explosion limit (LEL)</td>
<td>this information is not available</td>
</tr>
<tr>
<td>• upper explosion limit (UEL)</td>
<td>this information is not available</td>
</tr>
<tr>
<td>Explosion limits of dust clouds</td>
<td>these information are not available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>This information is not available.</td>
</tr>
<tr>
<td>Density</td>
<td>This information is not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>This information is not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>Information on this property is not available.</td>
</tr>
</tbody>
</table>
**SECTION 10: Stability and reactivity**

10.1 **Reactivity**
Dust explosibility.

10.2 **Chemical stability**
The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 **Possibility of hazardous reactions**
Violent reaction with: Strong oxidizer

10.4 **Conditions to avoid**
Direct light irradiation.

10.5 **Incompatible materials**
There is no additional information.

10.6 **Hazardous decomposition products**
Hazardous combustion products: see section 5.

**SECTION 11: Toxicological information**

11.1 **Information on toxicological effects**

- **Acute toxicity**
  Shall not be classified as acutely toxic.

- **Skin corrosion/irritation**
  Causes skin irritation.

- **Serious eye damage/eye irritation**
  Causes serious eye irritation.

- **Respiratory or skin sensitization**
  Shall not be classified as a respiratory or skin sensitizer.
Summary of evaluation of the CMR properties

Germ cell mutagenicity:
Suspected of causing genetic defects (if exposed)
Evidence for in vitro mutagenicity

• Specific target organ toxicity - single exposure
May cause respiratory irritation.

• Specific target organ toxicity - repeated exposure
Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard
Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

• If swallowed
nausea, vomiting

• If in eyes
Causes serious eye irritation

• If inhaled
Irritation to respiratory tract

• If on skin
causes skin irritation

Other information
Substance not yet fully tested

SECTION 12: Ecological information

12.1 Toxicity
acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.

12.2 Process of degradability
Theoretical Oxygen Demand with nitrification: 1.834 mg/mg
Theoretical Oxygen Demand: 1.506 mg/mg
Theoretical Carbon Dioxide: 1.912 mg/mg

12.3 Bioaccumulative potential
Data are not available.

12.4 Mobility in soil
Data are not available.

12.5 Results of PBT and vPvB assessment
Data are not available.

12.6 Other adverse effects
Data are not available.
Thiazolyl blue ≥ 98%, for biochemistry

article number: 4022

SECTION 13: Disposal considerations

13.1 Waste treatment methods
This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information
Do not empty into drains.

13.2 Relevant provisions relating to waste
The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

13.3 Remarks
Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1 UN number
(not subject to transport regulations)

14.2 UN proper shipping name
not relevant

14.3 Transport hazard class(es)
not relevant

14.4 Packing group
not relevant

14.5 Environmental hazards
none (non-environmentally hazardous acc. to the dangerous goods regulations)

14.6 Special precautions for user
There is no additional information.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code
The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

- Transport of dangerous goods by road or rail (49 CFR US DOT)
  Not subject to transport regulations.

- International Maritime Dangerous Goods Code (IMDG)
  Not subject to IMDG.

- International Civil Aviation Organization (ICAO-IATA/DGR)
  Not subject to ICAO-IATA.
SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

National regulations (United States)

Toxic Substance Control Act (TSCA)
Not listed.

SARA TITLE III (Superfund Amendment and Reauthorization Act)
List of Extremely Hazardous Substances (40 CFR 355) (EPCRA Section 302 and 304)
Not listed.
Specific Toxic Chemical Listings (40 CFR 372) (EPCRA Section 313)
Not listed.

CERCLA

Section 102(A) Hazardous Substances (40 CFR 302.4)
Not listed.

Clean Air Act
Not listed.

New Jersey Worker and Community Right to Know Act N.J.S.A. 34:5A-1 et. seq.
Not listed.

California Environmental Protection Agency (Cal/EPA): Proposition 65 Chemicals known to the State to cause cancer or reproductive toxicity
Not listed.

Drug precursors
Not listed.

Industry or sector specific available guidance(s)

NPCA-HMIS® III

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic</td>
<td>*</td>
<td>chronic (long-term) health effects may result from repeated overexposure</td>
</tr>
<tr>
<td>Health</td>
<td>2</td>
<td>temporary or minor injury may occur</td>
</tr>
<tr>
<td>Flammability</td>
<td>2</td>
<td>material that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur</td>
</tr>
<tr>
<td>Physical hazard</td>
<td>1</td>
<td>material that is normally stable but can become unstable (self-react) at high temperatures and pressures. Material may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors</td>
</tr>
<tr>
<td>Personal protection</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Chronic: Chronic hazard
Flammability: Flammability hazard
Health: Health hazard
Personal protection: Personal protective equipment (PPE) for normal use
Physical hazard: Reactivity
Thiazolyl blue ≥ 98%, for biochemistry

article number: 4022

**NFPA® 704**

<table>
<thead>
<tr>
<th>Category</th>
<th>Degree of hazard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>2</td>
<td>material that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur</td>
</tr>
<tr>
<td>Health</td>
<td>2</td>
<td>material that, under emergency conditions, can cause temporary incapacitation or residual injury</td>
</tr>
<tr>
<td>Instability</td>
<td>0</td>
<td>material that is normally stable, even under fire conditions</td>
</tr>
</tbody>
</table>

**Special hazard**
Flammability hazard
Health hazard
Instability hazard

**National inventories**
Substance is listed in the following national inventories:
- EINECS/ELINCS/NLP (Europe)
- DSL/NDSL (Canada)
- Toxic Substance Control Act (TSCA)

**15.2 Chemical Safety Assessment**
No Chemical Safety Assessment has been carried out for this substance.

**SECTION 16: Other information, including date of preparation or last revision**

**Abbreviations and acronyms**

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Descriptions of used abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>49 CFR US DOT</td>
<td>49 CFR § 40 U.S. Department of Transportation</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)</td>
</tr>
<tr>
<td>CERCLA</td>
<td>CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)</td>
</tr>
<tr>
<td>CMR</td>
<td>Carcinogenic, Mutagenic or toxic for Reproduction</td>
</tr>
<tr>
<td>DGR</td>
<td>Dangerous Goods Regulations (see IATA/DGR)</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Commercial Chemical Substances</td>
</tr>
<tr>
<td>ELINCS</td>
<td>European List of Notified Chemical Substances</td>
</tr>
<tr>
<td>GHS</td>
<td>“Globally Harmonized System of Classification and Labelling of Chemicals” developed by the United Nations</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>IATA/DGR</td>
<td>Dangerous Goods Regulations (DGR) for the air transport (IATA)</td>
</tr>
<tr>
<td>ICAO</td>
<td>International Civil Aviation Organization</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Dangerous Goods Code</td>
</tr>
<tr>
<td>MARPOL</td>
<td>International Convention for the Prevention of Pollution from Ships (abbr. of &quot;Marine Pollutant&quot;)</td>
</tr>
</tbody>
</table>
The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

**Key literature references and sources for data**
- Transport of dangerous goods by road or rail (49 CFR US DOT)
- Dangerous Goods Regulations (DGR) for the air transport (IATA)
- International Maritime Dangerous Goods Code (IMDG)

**List of relevant phrases (code and full text as stated in chapter 2 and 3)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>H315</td>
<td>causes skin irritation</td>
</tr>
<tr>
<td>H319</td>
<td>causes serious eye irritation</td>
</tr>
<tr>
<td>H335</td>
<td>may cause respiratory irritation</td>
</tr>
<tr>
<td>H341</td>
<td>suspected of causing genetic defects (if exposed)</td>
</tr>
</tbody>
</table>

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