Section 1 - Product and Company Information

Product Name: ANTU PESTANAL (1-(1-NAPHTHYL)-2-THIOUREA)
Product Number: 45328
Brand: RIEDEL

Company: Sigma-Aldrich Canada, Ltd
Address: 2149 Winston Park Drive
          Oakville ON L6H 6J8 CA
Technical Phone: 9058299500
Fax: 9058299292
Emergency Phone: 800-424-9300

Section 2 - Composition/Information on Ingredient

Substance Name: 1-(1-NAPHTHYL)-2-THIOUREA
CAS #: 86-88-4
SARA 313: Yes

Formula: C11H10N2S
Synonyms: Alphanaphthyl thiourea * Alphanaphtyl thiouree
           (French) * Alrato * ANTU (ACGIH:OSHA) * Anturat *
           Bantu * Chemical 109 * Dirax * Kill kantz *
           Krysid * Krysid PI * 1-Naftil-tiourea (Italian) *
           alpha-Naftylthiomocovina (Italian) *
           1-Naftylthioureaum (Dutch) *
           1-Naphthalenylthiourea *
           alpha-Naphthalthioharnstoff (German) *
           alpha-Naphthothiourea *
           alpha-Naphthylthiocarbamide *
           1-Naphthyl-thioharnstoff (German) * 1-Naphthyl
           thiourea * N-(1-Naphthyl)-2-thiourea *
           1-(1-Naphthyl)-2-thiourea *
           alpha-Naphthylthiourea (DOT:OSHA) *
           1-Naphthylthiouree (French) * Naphtox * Rattrack
           * Rat-TU * RCRA waste number P072 * Smeesana *
           Thiourea, 1-naphthalenyl- * U-5227 * USAF
           EK-P-5976

RTECS Number: YT9275000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Highly Toxic (USA) Very Toxic (EU).
Very toxic if swallowed. Limited evidence of a carcinogenic effect.
Possible Carcinogen (US).

HMIS RATING
HEALTH: 3*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING
HEALTH: 3
FLAMMABILITY: 0
REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE
If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

INHALATION EXPOSURE
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
User Exposure: Do not breathe dust. Do not get in eyes, on skin,
on clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.3 MG/M3</td>
</tr>
<tr>
<td>USA</td>
<td>MSHA Standard-air</td>
<td>TWA</td>
<td>0.3 MG/M3</td>
</tr>
<tr>
<td>USA</td>
<td>OSHA.</td>
<td>PEL</td>
<td>8H TWA 0.3 MG/M3</td>
</tr>
<tr>
<td>New Zealand OEL</td>
<td>Remarks: check ACGIH TLV</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

USA     | NIOSH        | TWA       | 0.3 MG/M3 |

Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular Weight</td>
<td>202.28 AMU</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BP/BP Range</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>MP/MP Range</td>
<td>192.0 - 198.0 °C</td>
<td></td>
</tr>
<tr>
<td>Freezing Point</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Vapor Density</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Saturated Vapor Conc.</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>SG/Density</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Bulk Density</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Volatile%</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>VOC Content</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Water Content</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Solvent Content</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Surface Tension</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Partition Coefficient</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Decomposition Temp.</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Explosion Limits</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Flammability</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>
Autoignition Temp       N/A
Refractive Index        N/A
Optical Rotation        N/A
Miscellaneous Data      N/A
Solubility             Other Solvents: H2O 0.6 G/L 25°C

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
  Stable: Stable.
  Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
  Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides, Sulfur oxides.

HAZARDOUS POLYMERIZATION
  Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
  Skin Contact: May cause skin irritation.
  Skin Absorption: May be harmful if absorbed through the skin.
  Eye Contact: May cause eye irritation.
  Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
  Ingestion: May be fatal if swallowed.

SIGNS AND SYMPTOMS OF EXPOSURE
  Potential symptoms of toxicity following ingestion of large doses are vomiting, dyspnea, cyanosis and coarse pulmonary rates; mild liver damage. May cause glomerular injury in nonlethal poisonings.

TOXICITY DATA

Oral
  Rat
  6 mg/kg
  LD50

  Intraperitoneal
  Rat
  2470 UG/KG
  LD50
  Remarks: Lungs, Thorax, or Respiration:Acute pulmonary edema.
  Lungs, Thorax, or Respiration:Pleural effusion.

Oral
  Mouse
  5 mg/kg
  LD50

  Intraperitoneal
  Mouse
  10 MG/KG
  LD50

  Oral
Dog
0.38 mg/kg
LD50

Intraperitoneal
Dog
16 MG/KG
LD50

Oral
Monkey
4250 mg/kg
LD50

Intraperitoneal
Monkey
175 MG/KG
LD50

Oral
Cat
500 mg/kg
LD50

Intraperitoneal
Guinea pig
350 MG/KG
LD50

Oral
Chicken
4250 mg/kg
LD50

Intraperitoneal
Chicken
2500 MG/KG
LD50

CHRONIC EXPOSURE - CARCINOGEN
Result: This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Species: Mouse
Route of Application: Subcutaneous
Dose: 5 MG/KG

IARC CARCINOGEN LIST
Rating: Group 3

ACGIH CARCINOGEN LIST
Rating: A4

CHRONIC EXPOSURE - MUTAGEN
Species: Hamster
Dose: 1600 UG/L
Section 12 - Ecological Information

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Naphthylthiourea
UN#: 1651
Class: 6.1
Packing Group: Packing Group II
Hazard Label: Toxic substances.
PIH: Not PIH

IATA
Proper Shipping Name: Naphthylthiourea
IATA UN Number: 1651
Hazard Class: 6.1
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: T+
Indication of Danger: Very toxic.
R: 28-40
Risk Statements: Very toxic if swallowed. Limited evidence of a carcinogenic effect.
S: 23-36/37-45
Safety Statements: Do not breathe fumes. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Highly Toxic (USA) Very Toxic (EU).
Risk Statements: Very toxic if swallowed. Limited evidence of a carcinogenic effect.
Safety Statements: Do not breathe fumes. After contact with skin, wash immediately with plenty of soap-suds. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
US Statements: Possible Carcinogen (US).

UNITED STATES REGULATORY INFORMATION
SARA LISTED: Yes
NOTES: This product is subject to SARA section 313 reporting requirements.
TSCA INVENTORY ITEM: Yes
CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: No
NDSL: Yes

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.
Copyright 2006 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.