1 Identification

· Product identifier

· Trade name: Flutamide

· Synonym
  2-methyl-N-[4-nitro-3-(trifluoromethyl)phenyl]-propanamide
  Niftolide
  NSC 147834
  NSC 251876
  SCH 13521

· Article number: 20359

· CAS Number: 13311-84-7

· EC number: 236-341-9

· Application of the substance / the mixture
  For research use only - not for human or veterinary use.

· Details of the supplier of the safety data sheet

· Manufacturer/Supplier:
  Cayman Chemical Co.
  1180 E. Ellsworth Rd.
  Ann Arbor, MI 48108
  USA

· Information department: Product safety department

· Emergency telephone number:
  During normal opening times: +1 (734) 971-3335
  US/CANADA: 800-424-9300
  Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

· Classification of the substance or mixture

  GHS08 Health hazard

  Repr. 2  H361  Suspected of damaging fertility or the unborn child.

  GHS07

  Acute Tox. 4  H302  Harmful if swallowed.
  Acute Tox. 4  H312  Harmful in contact with skin.
  Acute Tox. 4  H332  Harmful if inhaled.

· Label elements

· GHS label elements
  The substance is classified and labeled according to the Globally Harmonized System (GHS).

(Contd. on page 2)
Safety Data Sheet
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Trade name: Flutamide

· Hazard pictograms

GHS07  GHS08

· Signal word Warning

· Hazard statements
Harmful if swallowed, in contact with skin or if inhaled.
Suspected of damaging fertility or the unborn child.

· Precautionary statements
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Call a poison center/doctor if you feel unwell.
Rinse mouth.
If on skin: Wash with plenty of water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF exposed or concerned: Get medical advice/attention.
Specific treatment (see on this label).
Take off contaminated clothing and wash it before reuse.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:

· NFPA ratings (scale 0 - 4)

Health = 3
Fire = 0
Reactivity = 0

· HMIS-ratings (scale 0 - 4)

Health = 2
Fire = 0
Reactivity = 0

· Other hazards

· Results of PBT and vPvB assessment

· PBT: Not applicable.

· vPvB: Not applicable.

3 Composition/information on ingredients

· Chemical characterization: Substances

· CAS No. Description
13311-84-7 Flutamide
Trade name: Flutamide

Identification number(s)
EC number: 236-341-9

### 4 First-aid measures

**Description of first aid measures**
**General information:**
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
**After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
**After skin contact:** Generally the product does not irritate the skin.
**After eye contact:** Rinse opened eye for several minutes under running water.
**After swallowing:** Immediately call a doctor.
**Information for doctor:**
**Most important symptoms and effects, both acute and delayed**
May cause anemia, cough, CNS depression, drowsiness, headache, heart damage, lassitude (weakness, exhaustion), liver damage, narcosis, reproductive effects, teratogenic effects.
No further relevant information available.
**Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

### 5 Fire-fighting measures

**Extinguishing media**
**Suitable extinguishing agents:**
Use fire fighting measures that suit the environment.
A solid water stream may be inefficient.
**Special hazards arising from the substance or mixture**
No further relevant information available.
**Advice for firefighters**
**Protective equipment:** Mouth respiratory protective device.

### 6 Accidental release measures

**Personal precautions, protective equipment and emergency procedures** Not required.
**Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
**Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
**Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
**Protective Action Criteria for Chemicals**
**PAC-1:** Substance is not listed.
**PAC-2:** Substance is not listed.
**PAC-3:** Substance is not listed.
7 Handling and storage

- Handling:
  - Precautions for safe handling
    - Thorough dedusting.
    - Ensure good ventilation/exhaustion at the workplace.
- Information about protection against explosions and fires: No special measures required.
- Conditions for safe storage, including any incompatibilities
  - Keep container tightly closed.
  - Store in accordance with information listed on the product insert.
- Storage:
  - Requirements to be met by storerooms and receptacles: No special requirements.
  - Information about storage in one common storage facility: Not required.
  - Further information about storage conditions: Keep receptacle tightly sealed.
  - Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.
- Control parameters
  - Components with limit values that require monitoring at the workplace:
    - The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
    - The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
    - At this time, the remaining constituent has no known exposure limits.
    - At this time, the other constituents have no known exposure limits.
  - Additional information: The lists that were valid during the creation were used as basis.
- Exposure controls
  - Personal protective equipment:
    - General protective and hygienic measures:
      - Keep away from foodstuffs, beverages and feed.
      - Wash hands before breaks and at the end of work.
      - Avoid contact with the eyes and skin.
    - Breathing equipment:
      - In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
    - Protection of hands:
      - Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
- Material of gloves
  - The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Trade name: Flutamide

- **Penetration time of glove material**
  The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection**: Not required.

## 9 Physical and chemical properties

<table>
<thead>
<tr>
<th>Information on basic physical and chemical properties</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Information</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Form: Crystalline</td>
<td></td>
</tr>
<tr>
<td>Color: Not determined.</td>
<td></td>
</tr>
<tr>
<td>Odor: Characteristic</td>
<td></td>
</tr>
<tr>
<td><strong>Structural Formula</strong></td>
<td>C11H11F3N2O3</td>
</tr>
<tr>
<td><strong>Molecular Weight</strong></td>
<td>276.2 g/mol</td>
</tr>
<tr>
<td><strong>Odor threshold</strong>: Not determined.</td>
<td></td>
</tr>
<tr>
<td><strong>pH-value</strong>: Not applicable.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Change in condition</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Melting point/Melting range:</strong> Undetermined.</td>
<td></td>
</tr>
<tr>
<td><strong>Boiling point/Boiling range:</strong> Undetermined.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flammability (solid, gaseous):</th>
<th>Product is not flammable.</th>
</tr>
</thead>
</table>

| Decomposition temperature: | Not determined. |
| Auto igniting: | Not determined. |
| Danger of explosion: | Product does not present an explosion hazard. |

<table>
<thead>
<tr>
<th>Explosion limits:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lower</strong>: Not determined.</td>
<td></td>
</tr>
<tr>
<td><strong>Upper</strong>: Not determined.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vapor pressure:</th>
<th>Not applicable.</th>
</tr>
</thead>
</table>

| Density: | Not determined. |
| Relative density: | Not determined. |
| Vapor density: | Not applicable. |
| Evaporation rate: | Not applicable. |

<table>
<thead>
<tr>
<th>Solubility in / Miscibility with</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water</strong>: Not determined.</td>
<td></td>
</tr>
</tbody>
</table>

| Partition coefficient (n-octanol/water): | Not determined. |

| Viscosity: |  |
| Dynamic: | Not applicable. |
| Kinematic: | Not applicable. |
| SOLUBILITY | ~30 mg/ml in EtOH; DMSO; DMF |

| Other information | No further relevant information available. |
10 Stability and reactivity

- Reactivity: No further relevant information available.
- Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions: No dangerous reactions known.
- Conditions to avoid: No further relevant information available.
- Incompatible materials: strong oxidizing agents
- Hazardous decomposition products: carbon oxides, hydrogen fluoride, nitrogen oxides

11 Toxicological information

- RTECS Number: UG5700000
- Information on toxicological effects
- Acute toxicity:
  - LD/LC50 values that are relevant for classification:
    
    | Route          | Value         |
    |----------------|---------------|
    | Oral LD50      | 787 mg/kg (rat) |
    | TDLO           | 310 mg/kg (human) |
    | Subcutaneous TDLO | 17.5 mg/kg (rat) |
    | Intraperitoneal LD50 | 289 mg/kg (rat) |
  - Primary irritant effect:
    - on the skin: No irritant effect.
    - on the eye: No irritating effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information:
  - Carcinogenic categories:
    - IARC (International Agency for Research on Cancer): Substance is not listed.
    - NTP (National Toxicology Program): Substance is not listed.
    - OSHA-Ca (Occupational Safety & Health Administration): Substance is not listed.

12 Ecological information

- Toxicity
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability: No further relevant information available.
- Behavior in environmental systems:
- Bioaccumulative potential: No further relevant information available.
- Mobility in soil: No further relevant information available.
- Additional ecological information:
- General notes:
  Water hazard class 1 (Self-assessment): slightly hazardous for water
  Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.
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<table>
<thead>
<tr>
<th>13 Disposal considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Waste treatment methods</td>
</tr>
<tr>
<td>· Recommendation: Must not be disposed of together with household garbage. Do not allow product to reach sewage system.</td>
</tr>
<tr>
<td>· Uncleaned packagings:</td>
</tr>
<tr>
<td>· Recommendation: Disposal must be made according to official regulations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14 Transport information</th>
</tr>
</thead>
<tbody>
<tr>
<td>· UN-Number</td>
</tr>
<tr>
<td>· DOT, IMDG, IATA not regulated</td>
</tr>
<tr>
<td>· UN proper shipping name</td>
</tr>
<tr>
<td>· DOT, IMDG, IATA not regulated</td>
</tr>
<tr>
<td>· Transport hazard class(es)</td>
</tr>
<tr>
<td>· DOT, ADN, IMDG, IATA</td>
</tr>
<tr>
<td>· Class not regulated</td>
</tr>
<tr>
<td>· Packing group</td>
</tr>
<tr>
<td>· DOT, IMDG, IATA not regulated</td>
</tr>
<tr>
<td>· Environmental hazards: Not applicable.</td>
</tr>
<tr>
<td>· Special precautions for user Not applicable.</td>
</tr>
<tr>
<td>· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</td>
</tr>
<tr>
<td>· UN &quot;Model Regulation&quot;: not regulated</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15 Regulatory information</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Safety, health and environmental regulations/legislation specific for the substance or mixture</td>
</tr>
<tr>
<td>· Sara</td>
</tr>
<tr>
<td>· Section 355 (extremely hazardous substances): Substance is not listed.</td>
</tr>
<tr>
<td>· Section 313 (Specific toxic chemical listings): Substance is not listed.</td>
</tr>
<tr>
<td>· TSCA (Toxic Substances Control Act): Substance is not listed.</td>
</tr>
<tr>
<td>· Hazardous Air Pollutants Substance is not listed.</td>
</tr>
<tr>
<td>· Proposition 65</td>
</tr>
<tr>
<td>· Chemicals known to cause cancer: Substance is not listed.</td>
</tr>
<tr>
<td>· Chemicals known to cause reproductive toxicity for females: Substance is not listed.</td>
</tr>
<tr>
<td>· Chemicals known to cause reproductive toxicity for males: Substance is not listed.</td>
</tr>
<tr>
<td>· Chemicals known to cause developmental toxicity: Substance is listed.</td>
</tr>
<tr>
<td>· Carcinogenic categories</td>
</tr>
<tr>
<td>· EPA (Environmental Protection Agency) Substance is not listed.</td>
</tr>
<tr>
<td>· TLV (Threshold Limit Value established by ACGIH) Substance is not listed.</td>
</tr>
<tr>
<td>· NIOSH-Ca (National Institute for Occupational Safety and Health) Substance is not listed.</td>
</tr>
</tbody>
</table>
Trade name: Flutamide

- **GHS label elements**
  The substance is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**
  
  ![GHS07](image1) ![GHS08](image2)

- **Signal word** Warning

- **Hazard statements**
  Harmful if swallowed, in contact with skin or if inhaled.
  Suspected of damaging fertility or the unborn child.

- **Precautionary statements**
  Obtain special instructions before use.
  Do not handle until all safety precautions have been read and understood.
  Avoid breathing dust/fume/gas/mist/vapors/spray
  Wash thoroughly after handling.
  Do not eat, drink or smoke when using this product.
  Use only outdoors or in a well-ventilated area.
  Wear protective gloves/protective clothing/eye protection/face protection.
  If swallowed: Call a poison center/doctor if you feel unwell.
  Rinse mouth.
  If on skin: Wash with plenty of water.
  IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  IF exposed or concerned: Get medical advice/attention.
  Specific treatment (see on this label).
  Take off contaminated clothing and wash it before reuse.
  Store locked up.
  Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Chemical safety assessment**: A Chemical Safety Assessment has not been carried out.

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### 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing SDS**: Environment protection department.

- **Contact**: -

- **Date of preparation / last revision**: 08/31/2020 / -

- **Abbreviations and acronyms**:
  - IMDG: International Maritime Code for Dangerous Goods
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - ACGIH: American Conference of Governmental Industrial Hygienists
  - EINECS: European Inventory of Existing Commercial Chemical Substances
  - CAS: Chemical Abstracts Service (division of the American Chemical Society)
  - NFPA: National Fire Protection Association (USA)
  - HMIS: Hazardous Materials Identification System (USA)
  - LC50: Lethal concentration, 50 percent
  - LD50: Lethal dose, 50 percent
  - PBT: Persistent, Bioaccumulative and Toxic
  - vPvB: very Persistent and very Bioaccumulative
  - NIOSH: National Institute for Occupational Safety
  - OSHA: Occupational Safety & Health
  - TLV: Threshold Limit Value
  - PEL: Permissible Exposure Limit
  - REL: Recommended Exposure Limit
Trade name: Flutamide

Acute Tox. 4: Acute toxicity – Category 4
Repr. 2: Reproductive toxicity – Category 2

* Data compared to the previous version altered.