## SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

<table>
<thead>
<tr>
<th><strong>Product Name</strong></th>
<th>BRONATE Advanced™ Herbicide</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical Name</strong></td>
<td>Octanoic Ester of Bromoxynil; Heptanoic Ester of Bromoxynil; MCPA, Ethylhexyl Ester</td>
</tr>
<tr>
<td><strong>Synonym</strong></td>
<td></td>
</tr>
<tr>
<td><strong>MSDS Number</strong></td>
<td>1684</td>
</tr>
<tr>
<td><strong>Chemical Family</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Chemical Formulation</strong></td>
<td>Emulsifiable Concentrate</td>
</tr>
<tr>
<td><strong>EPA Registration No.</strong></td>
<td>264-690</td>
</tr>
<tr>
<td><strong>Canadian Registrat. No.</strong></td>
<td></td>
</tr>
</tbody>
</table>

Bayer CropScience
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
USA

For Product Use Information: (866)-992-2937 Monday through Friday(CRLF) 8:00AM-4:30PM(CRLF) For Medical Emergency contact DART: (800) 334-7577 24 Hours/Day(CRLF)
For Transportation Emergency CHEMTREC: (800) 424-9300 24 Hours/Day

**Product Use Description**
BRONATE Advanced is a selective postemergence herbicide for control if imported broadleaf weeds infesting wheat, barley, oats, rye, flax and grass grown sod.

FIFRA regulated use only.

## SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th><strong>Component Name</strong></th>
<th><strong>CAS No.</strong></th>
<th><strong>Concentration % by Weight</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>BROMOXYNIL OCTANOATE</td>
<td>1689-99-2</td>
<td>18.7000</td>
</tr>
<tr>
<td>BROMOXYNIL HEPTANOATE</td>
<td>56634-95-8</td>
<td>18.1000</td>
</tr>
<tr>
<td>ISOOCTYL ESTER OF MCPA</td>
<td>26544-20-7</td>
<td>40.0000</td>
</tr>
<tr>
<td>Inert ingredients,including:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium dodecylbenzene sulfonate</td>
<td>26264-06-2</td>
<td>4.0000</td>
</tr>
</tbody>
</table>

SECTION 3. HAZARDS IDENTIFICATION

NOTE: Please refer to Section 11 for detailed toxicological information.

Emergency Overview

Physical State
liquid

Odor
mild hydrocarbon

Appearance
amber

Immediate Effects

Eye
Causes redness, tearing. Vapors and mists can cause irritation.

Skin
Harmful if absorbed through the skin. May cause irritation, redness, swelling.

Ingestion
Harmful if ingested. May cause nausea, vomiting, abdominal pain, weakness of arms and/or legs. Dizziness, loss of coordination. Aspiration of the swallowed or vomited product can cause severe pulmonary complications.

Inhalation
Harmful if inhaled. May cause upper respiratory tract irritation, coughing, wheezing, nausea, headache, depression.

Chronic or Delayed Long-Term
Prolonged contact may cause chronic dermatitis, developmental problems. Prolonged contact can cause liver damage, kidney damage, central nervous system damage, anemia. This product contains ingredients that are considered to be probable or suspected human carcinogens (See Section 11 - Chronic).

Medical Conditions Aggravated by Exposure
Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

SECTION 4. FIRST AID MEASURES

Eye
Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

Skin
Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Ingestion
Immediately call a poison control center or doctor for treatment advice. Do not induce vomiting unless told to do so by a poison control center or doctor. Have a person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person.
Inhalation

Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.

Note to Physician

All treatment should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Treat symptomatically. No specific antidote available.

This product contains petroleum distillate - vomiting may cause aspiration pneumonia.

This product is irritating to mucous membranes. If large amounts (greater than 1 ml/kg body weight) of the product have been ingested, the stomach should be evacuated by gastric intubation with the aid of a cuffed endotracheal tube to prevent exposure of the esophagus. After removal of stomach contents, wash stomach by instilling 30-50 g. of activated charcoal in 3-4 ounces of water through the stomach tube and again remove stomach contents. Avoid oily laxatives.

This product contains a phenoxy herbicide. Myotoxic effects may include muscle fibrillations, myotonia, and muscular weakness. Ingestion of massive doses may result in persistent fall of blood pressure. Myoglobin and hemoglobin may be found in urine. Elevations in lactate dehydrogenase (LDH), SGOT, SGPT and aldolase indicate the extent of muscle damage. It has been suggested that overexposure in humans may affect both the central and peripheral nervous systems. The acute effects on the central nervous system resemble those produced by alcohol or sedative drugs. In isolated cases, peripheral neuropathy and reduced nerve conduction velocities have been reported although these observations may be related to other factors.

Gas-liquid chromatography for detecting and measuring chlorophenoxy compounds in blood and urine may be useful in confirming and assessing the magnitude of chlorophenoxy absorption.

SECTION 5. FIRE FIGHTING MEASURES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>60.6 °C / 141.1 °F</td>
</tr>
<tr>
<td>Method:</td>
<td>Pensky Martens Closed Cup</td>
</tr>
<tr>
<td>Flammable.</td>
<td></td>
</tr>
<tr>
<td>Auto Ignition</td>
<td>Not available</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>Fire and Explosion</td>
<td>Under fire conditions, toxic, corrosive</td>
</tr>
<tr>
<td>Hazards</td>
<td>fumes are emitted. Containers may</td>
</tr>
<tr>
<td></td>
<td>explode (due to the build-up of pressure)</td>
</tr>
<tr>
<td></td>
<td>when exposed to extreme heat. Vapors</td>
</tr>
<tr>
<td></td>
<td>may travel a considerable distance to a</td>
</tr>
<tr>
<td></td>
<td>source of ignition and flash back along</td>
</tr>
<tr>
<td></td>
<td>vapor trail.</td>
</tr>
</tbody>
</table>
Suitable Extinguishing Media

Small Fires: dry chemical, carbon dioxide (CO2)
Large Fires: alcohol foam, polymer foam
Not Recommended: water, fire could spread readily as a burning liquid

Fire Fighting Instructions

Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Keep unnecessary people away, isolate hazard area and deny entry. Evacuate residents who are downwind of fire. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later. Persons who may have been exposed to contaminated smoke should be immediately examined by a physician and checked for symptoms of poisoning. The symptoms should not be mistaken for heat exhaustion or smoke inhalation. Cool containers exposed to fire with water.

SECTION 6. ACCIDENTAL RELEASE MEASURES

General and Disposal
Evacuation Procedures and Safety: Wear appropriate gear for the situation. See Personal Protection information in Section 8. Eliminate all sources of ignitions until the area is determined to be free from explosion of fire hazards.

Cleanup and Disposal of Spill: Pump any free liquid into an appropriate closed container. Recover material, if possible. Absorb with vermiculite or other inert absorbent. Shovel up into an appropriate closed container (see Section 7: Handling and Storage). No sparking tools should be used. Decontaminate tools and equipment following cleanup.

Land Spill or Leaks
Containment of Spill: Dike spill using absorbent or impervious materials such as earth, sand or clay. Follow procedure under Cleanup and Disposal of Spill.

Environmental and Regulatory Reporting: Do not flush to drain. Prevent material from entering public sewer system or any waterway. If spilled on the ground, the affected area should be removed to a depth of one or two inches and placed in an appropriate container for disposal. Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

SECTION 7. HANDLING AND STORAGE

Handling Procedures
Do not get on skin or in eyes. Do not ingest. Avoid breathing vapors. Keep from freezing.

Storing Procedures
Store in an area away from food, feedstuffs, fertilizers and seed. Do not use or store near heat or open flame. If freezing occurs, thaw and remix before using.

Work/Hygienic Procedures
Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:
Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.

Remove clothing immediately if pesticide gets inside. Remove Personal Protective Equipment (PPE) immediately after handling this product. Wash the outside of gloves before removing. Then wash thoroughly and put on clean clothing.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product’s concentrate. Do not reuse them.

Follow manufacturer’s instructions for cleaning/maintaining Personal Protective Equipment (PPE). If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Min/Max Storage Temperatures

-16 °C
SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls
Where engineering controls are indicated by use conditions of a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures: local exhaust ventilation at the point of generation.

Eye/Face Protection
Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.

Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles. An emergency eye wash must be readily accessible to the work area.

Body Protection
Skin contact should be prevented through use of suitable protective clothing, gloves and footwear, selected with regard of use conditions and exposure potential. Consideration must be given both to durability as well as permeation resistance.

When cleaning equipment, mixing or reloading Applicators and other handlers must wear: Long-sleeved shirt and long pants Chemical resistant gloves, such as barrier laminate, or Vitron >/= 14 mils chemical resistant apron shoes plus socks

Respiratory Protection
When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Under normal conditions, in the absence of other airborne contaminants, the following should provide protection from this material up to the conditions specified by the appropriate OSHA, WHMIS or ANSI standard(s): Air-purifying (half-mask/full-face) respirator with cartridge/canister approved for use against pesticides.

Under conditions immediately dangerous to life or health, or emergency conditions with unknown concentrations, use a full-face positive pressure air-supplied respirator equipped with an emergency escape air supply unit or use a self-contained breathing apparatus unit.

General Protection
Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry intervals.
Do not enter or allow worker entry into treated crops during the restricted entry interval (REI).

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls over long-sleeved shirt and long pants
- Chemical resistant gloves such as nitrile, viton or barrier laminate
- Shoes plus socks
- Protective eyewear

Exposure Limits

None Established

<table>
<thead>
<tr>
<th>SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
</tr>
<tr>
<td>Physical State</td>
</tr>
<tr>
<td>Odor</td>
</tr>
<tr>
<td>pH</td>
</tr>
<tr>
<td>Vapor Pressure</td>
</tr>
<tr>
<td>Vapor Density (air = 1)</td>
</tr>
<tr>
<td>Specific Gravity</td>
</tr>
<tr>
<td>Boiling Point</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
</tr>
</tbody>
</table>
Material Safety Data Sheet

BRONATE Advanced™ Herbicide

Other Information

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product Information phone number in Section 1 for its exact specifications.

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability

This material is stable under normal handling and storage conditions described in Section 7.

Conditions to Avoid

elevated temperatures
open flame
spark
static electricity

Incompatibility

strong bases
strong oxidizing agents
mineral acids

Hazardous Products of Decomposition

Decomposition Type: thermal
hydrogen bromide
hydrogen chloride
oxides of nitrogen
oxides of sulfur
carbon oxides

Hazardous Polymerization (Conditions to avoid)

not applicable

SECTION 11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity

Rat: LD50: 530 mg/kg

Acute Dermal Toxicity

Rabbit: LD50: > 5,050 mg/kg

Acute Inhalation Toxicity

Rat: LC50: 2.77 mg/l 4 h
Acute Respiratory Irritation:
No test data found for product.

Skin Irritation

Rabbit: Slightly irritating

Eye Irritation

Rabbit: Minimally irritating.

Chronic Toxicity

The following data is for the specified ingredients. CHLOROPHENOXYL HERBICIDES: Chlorophenoxy herbicides are listed as class 2B carcinogens (limited evidence for carcinogenicity in humans) by the International Agency for Research on Cancer (IARC). The Science Advisory Panel of USEPA has given a Class D classification (not classifiable as to...
human carcinogenicity) and has required additional animal studies on 2,4-D. Various animal cancer tests have shown no reliable positive association between 2,4-D exposure and cancer. Recent results from a lifetime study in laboratory animals did not show evidence of carcinogenic effects caused by 2,4-D.

BROMOXYNIL COMPOUNDS: EPA has classified Bromoxynil as a Class C carcinogen. Based upon the results of rat and rabbit teratogenicity studies, Bromoxynil phenol is considered to be a developmental toxicant. Women of childbearing age should be particularly careful when handling this product to avoid ingestion and skin contact. Although three in vitro genetic toxicity studies were positive for Bromoxynil phenol, four additional in vitro studies and two in vivo studies were negative. Therefore, the weight of evidence indicates that Bromoxynil phenol does not produce genetic toxicity.

MCPA COMPOUNDS: MCPA has been shown to produce negative and positive results in various in vitro genetic toxicity tests. In studies with MCPA, teratogenic effects were observed in laboratory animals, but only at maternally toxic doses.

Assessment Carcinogenicity

<table>
<thead>
<tr>
<th>ACGIH</th>
<th>None</th>
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<tbody>
<tr>
<td>NTP</td>
<td>None</td>
</tr>
<tr>
<td>IARC</td>
<td>None</td>
</tr>
<tr>
<td>OSHA</td>
<td>None</td>
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</table>

SECTION 12. ECOLOGICAL INFORMATION

Environmental Precautions

This pesticide is toxic to wildlife and fish. Use with care when applying to areas frequented by wildlife or adjacent to any body of water. For terrestrial uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below mean high water mark. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water by cleaning of equipment or disposal of equipment wastewaters.

Ecological Information

For ecotoxicological data call the product information phone number listed in Section 1.
Material Safety Data Sheet
BRONATE Advanced™ Herbicide

Environmental Fate
For chemical fate data call the product information phone number listed in Section 1.

SECTION 13. DISPOSAL CONSIDERATIONS

General Disposal Guidance
Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

Pesticide Disposal: Wastes resulting from use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal
Triple rinse (or equivalent). Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or incineration, or if allowed by State and Local authorities, by burning. If burned, stay out of smoke.

EPA Hazardous Waste - Yes

RCRA Classification
Not Regulated under this Statute

SECTION 14. TRANSPORT INFORMATION

Domestic Highway:
Non Bulk: Not Regulated

Bulk (>119 gal)
Combustible Liquid, N.O.S. (Xylene Range Solvents), 3, NA1993, PG III, Marine Pollutant (Bromoxynil), ERG # 128

SECTION 15. REGULATORY INFORMATION

US Federal
EPA Registration No. 264-690
TSCA list
BROMOXYNIL OCTANOATE 1689-99-2
Calcium dodecylbenzene sulfonate 26264-06-2
TSCA 12b export notification
None
SARA Title III - section 302 - notification and information
None
SARA Title III - section 313 - toxic chemical release reporting
BROMOXYNIL OCTANOATE 1689-99-2 1.0%
US States Regulatory
CA Prop65
This product does not contain any substances known to the State of California to cause cancer.

US State right-to-know ingredients
BROMOXYNIL OCTANOATE 1689-99-2 NJ
Calcium dodecylbenzene sulfonate 26264-06-2 CA, CT, IL, NJ, PA

Canadian Regulations
Canadian Registrat. No.
Canadian Domestic Substance List
Calcium dodecylbenzene sulfonate 26264-06-2

Environmental
CERCLA
Calcium dodecylbenzene sulfonate 26264-06-2 1,000 lbs

Clean Water Section 307 Priority Pollutants
None

Safe Drinking Water Act Maximum Contaminant Levels
None

International Regulations
EU Classification
BROMOXYNIL OCTANOATE 1689-99-2 Harmful Dangerous for the environment
R Phrases Harmful in contact with skin and if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Possible risk of harm to the unborn child.
S Phrases Keep out of the reach of children. Wear suitable protective clothing and gloves. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

European Inventory of Existing Commercial Substances (EINECS)
BROMOXYNIL OCTANOATE 1689-99-2
BROMOXYNIL HEPTANOATE 56634-95-8
ISOOCTYL ESTER OF MCPA 26544-20-7
Calcium dodecylbenzene sulfonate 26264-06-2
## SECTION 16. OTHER INFORMATION

<table>
<thead>
<tr>
<th></th>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NFPA</td>
<td>1</td>
<td>2</td>
<td>1</td>
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</tbody>
</table>

Reason for Revisions: Company name change.

Print Date: 12/26/2002
Supersedes MSDS, which is older than: 12/19/2002

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