Material Safety Data Sheet
AUTHORITY™ 480 HERBICIDE

1. PRODUCT AND COMPANY IDENTIFICATION

Product name
AUTHORITY™ 480 HERBICIDE

Formula code
1466-A

Active Ingredient(s)
Sulfentrazone.

Alternate Commercial Name
Authority™ 4 F; Boral™ 480 SC; Spartan™ 4F

Synonyms
FMC 97285; 2’4’-dichloro-5’-(4-difluoromethyl-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl) methanesulfonanilide; N-[2,4-dichloro-5-[4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl]phenyl] methanesulfonamide

Chemical Family
Triazolinones

Recommended use
Herbicide

Manufacturer
FMC Corporation
Agricultural Products Group
1735 Market Street
Philadelphia, PA 19103
General Information:
Phone: (215) 299-6000
E-Mail: msdsinfo@fmc.com

Emergency telephone number
For leak, fire, spill or accident emergencies, call:
+1 800.424.9300 (CHEMTREC - U.S.A.)
+1 703.527.3887 (CHEMTREC - Collect - All Other Countries)
Medical Emergencies:
(800) 331-3148 (U.S.A. & Canada)
+1 (651) 632-6793 (All Other Countries - Collect)

2. Hazards identification

Appearance
off-white liquid

Physical state
liquid

Odor
Faint Alcohol

Potential health effects
Eye contact, Skin contact, Inhalation, Ingestion.

Acute effects
Eyes
May cause slight irritation.
Skin
Substance may cause slight skin irritation.
Inhalation
May cause irritation of respiratory tract. May cause drowsiness and dizziness.
Ingestion
May cause central nervous system depression. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic effects
Effects are expected to be similar to those that are seen with acute toxicity. Contains toluene.
Exposure to toluene in animals via inhalation and intentional overexposure to toluene in humans has caused adverse fetal development effects.
3. Composition/information on ingredients

Hazardous ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfentrazone</td>
<td>122836-35-5</td>
<td>40</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>57-55-6</td>
<td>5-10</td>
</tr>
<tr>
<td>Oxirane, methyl-, polymer with oxirane, monobutyl ester</td>
<td>9038-95-3</td>
<td>4</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>&lt;3</td>
</tr>
</tbody>
</table>

4. First aid measures

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

Skin contact
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.

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

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

5. Fire-fighting measures

Flash Point
> 94 °C / > 201 °F

Method
Tag Closed Cup

Sensitivity to Mechanical Impact
not applicable

Sensitivity to Static Discharge
not applicable

Suitable extinguishing media

Protective equipment and precautions
Wear self-contained breathing apparatus and protective suit.

NFPA

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Stability</th>
<th>Special Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

6. Accidental release measures

Personal precautions
Isolate and post spill area. Remove all sources of ignition. Wear suitable protective clothing, gloves and eye/face protection. For personal protection see section 8.

Environmental precautions
Keep people and animals away from and upwind of spill/leak. Keep material out of lakes, streams, ponds, and sewer drains.

Methods for containment
Dike to prevent runoff. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
Methods for cleaning up

Clean and neutralize spill area, tools and equipment by washing with bleach water and soap. Absorb rinsate and add to the collected waste. Waste must be classified and labeled prior to recycling or disposal. Dispose of waste as indicated in Section 13.

Other

For further clean-up instructions call FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.

7. Handling and storage

Handling

Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.

Storage

Keep in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep out of reach of children and animals. Store in original container.

8. Exposure controls/personal protection

Exposure guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene 108-88-3</td>
<td>TWA: 20 ppm</td>
<td>TWA: 200 ppm</td>
<td>IDLH: 500 ppm</td>
<td>Mexico: S*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceiling: 300 ppm</td>
<td>TWA: 100 ppm TWA: 375 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>STEL: 150 ppm STEL: 560 mg/m³</td>
<td>Mexico: TWA 50 ppm Mexico: TWA 188 mg/m³</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>British Columbia: TWA: 20 ppm</td>
<td>Quebec: TWA: 50 ppm TWA: 155 mg/m³</td>
<td>Ontario TWA EV: TWA: 20 ppm</td>
<td></td>
</tr>
<tr>
<td>57-55-6</td>
<td></td>
<td></td>
<td>Skin</td>
<td>Alberta: TWA: 50 ppm TWA: 188 mg/m³</td>
</tr>
<tr>
<td>Toluene 108-88-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Occupational exposure controls

Engineering measures

Apply technical measures to comply with the occupational exposure limits. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.

Personal Protective Equipment

General Information

If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied.

Respiratory protection

For dust, splash, mist or spray exposures wear a filtering mask.

Eye/face protection

For dust, splash, mist or spray exposure, wear chemical protective goggles or a face-shield.

Skin and body protection

Wear long-sleeved shirt, long pants, socks, shoes, and gloves.

Hand protection

Protective gloves

Hygiene measures

Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking, chewing gum or using tobacco. Shower or bathe at the end of working. Remove and wash contaminated clothing before re-use. Launder work clothing separately from regular household laundry.
9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>off-white liquid</td>
</tr>
<tr>
<td>Color</td>
<td>off-white</td>
</tr>
<tr>
<td>Physical state</td>
<td>liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>Faint Alcohol</td>
</tr>
<tr>
<td>pH</td>
<td>5.3-6.0 @ 20°C</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>No information available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No information available</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>not applicable</td>
</tr>
<tr>
<td>Flash Point</td>
<td>&gt; 94 °C / &gt; 201 °F Tag Closed Cup</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>not applicable</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>not applicable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.206 @ 20 °C (water = 1)</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Dispersible in water</td>
</tr>
<tr>
<td>Percent volatile</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient:</td>
<td>not applicable</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>not applicable</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Excessive heat</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Carbon oxides, nitrogen oxides (NOx), Sulfur oxides, Hydrogen chloride, Hydrogen fluoride.</td>
</tr>
<tr>
<td>Hazardous polymerization</td>
<td>Hazardous polymerization does not occur</td>
</tr>
</tbody>
</table>

11. Toxicological information

**Acute Toxicity**
- Signs of toxicity in laboratory animals, with sulfentrazone, included clonic convulsions, ataxia, hypersensitivity to touch, chromorphinen.face, abdominogenital staining, decreased locomotion, lacrimation, nasal discharge, and squinting eyes.

<table>
<thead>
<tr>
<th>Exposure Route</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye contact</td>
<td>Slightly or non-irritating (rabbit)</td>
</tr>
<tr>
<td>Skin contact</td>
<td>Slightly or non-irritating (rabbit)</td>
</tr>
<tr>
<td>LD50 Dermal</td>
<td>&gt; 2000 mg/kg (rabbit)</td>
</tr>
<tr>
<td>LD50 Oral</td>
<td>2084 mg/kg (rat)</td>
</tr>
<tr>
<td>LC50 Inhalation:</td>
<td>&gt; 2.72 mg/L 4 hr (rat) - Maximum attainable concentration (zero mortality)</td>
</tr>
</tbody>
</table>

**Chronic Toxicity - Other Ingredient(s)**

- Effects are expected to be similar to those that are seen with acute toxicity. Contains toluene. Exposure to toluene in animals via inhalation and intentional overexposure to toluene in humans has caused adverse fetal development effects.

**Carcinogenicity**
- Sulfentrazone: Did not show carcinogenic effects in animal experiments.

**Mutagenicity**
- Sulfentrazone: Did not show mutagenic effects in animal experiments.

**Reproductive toxicity**
- Offspring Toxicity (sulfentrazone): LOAEL = 33 mg/kg/day for males; 40 mg/kg/day for females.
Neurological Effects
Sulfentrazone: Altered motor activity and FOB effects, which reverse after single exposure, with no signs of histopathology

Developmental Toxicity
Sulfentrazone: NOAEL of 10 mg/kg/day in the developmental toxicity study in rat. NOAEL of 14 mg/kg/day in a 2-generation reproduction study. Contains ingredients that have suspected developmental hazards. Inhalation of toluene vapors at high doses have resulted in an increased incidence of malformations and decreased fetal weight in laboratory animals

Target Organ Effects
Sulfentrazone: Hematopoietic System.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
<th>NIOSH - Target Organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CNS, eyes, kidneys, liver, respiratory system, skin</td>
</tr>
</tbody>
</table>

12. Ecological information

Ecotoxicity

Ecotoxicity effects
Very toxic to aquatic organisms.

<table>
<thead>
<tr>
<th>Active Ingredient(s)</th>
<th>Duration</th>
<th>Species</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120 h LC50</td>
<td>Algae</td>
<td>31</td>
<td>µg/L</td>
</tr>
<tr>
<td>Sulfentrazone</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>48 h LC50</td>
<td>Aquatic organisms</td>
<td>60.4</td>
<td>mg/L</td>
</tr>
<tr>
<td></td>
<td>96 h LC50</td>
<td>Fish</td>
<td>94</td>
<td>mg/L</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Bobwhite quail</td>
<td>&gt;2250</td>
<td>mg/kg</td>
</tr>
<tr>
<td></td>
<td>LD50 Dietary</td>
<td>Mallard duck</td>
<td>&gt;5620</td>
<td>ppm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Toxicity to algae</th>
<th>Toxicity to fish</th>
<th>Toxicity to microorganisms</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol</td>
<td>19000 mg/L EC50 96 h (Pseudokirchneriella subcapitata)</td>
<td>LC50 51600 mg/L</td>
<td>Oncorhynchus mykiss 96 h LC50 41 - 47 mL/L</td>
<td>EC50 &gt; &gt;10000 mg/L 24 h EC50 &gt; &gt;10000 mg/L 48 h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oncorhynchus mykiss 96 h LC50 51400 mg/L Pimephales promelas 96 h LC50 710 mg/L Pimephales promelas 96 h</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oncorhynchus mykiss 96 h LC50 14.1-17.16 mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oncorhynchus mykiss 96 h LC50 5.8 mg/L Oncorhynchus mykiss 96 h LC50 11.0-15.0 mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lepomis macrochirus 96 h LC50 54 mg/L Epitylotes latipes 96 h LC50 28.2 mg/L Poecilia reticulata 96 h LC50 50.87-70.34 mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poecilia reticulata 96 h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>&gt;433 mg/L EC50 96 h (Pseudokirchneriella subcapitata) 12.5 mg/L EC50 72 h (Pseudokirchneriella subcapitata)</td>
<td>LC50 15.22-19.05 mg/L Pimephales promelas 96 h LC50 12.6 mg/L Pimephales promelas 96 h LC50 5.89-7.81 mg/L Oncorhynchus mykiss 96 h LC50 14.1-17.16 mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oncorhynchus mykiss 96 h LC50 11.0-15.0 mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lepomis macrochirus 96 h LC50 54 mg/L Epitylotes latipes 96 h LC50 28.2 mg/L Poecilia reticulata 96 h LC50 50.87-70.34 mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poecilia reticulata 96 h</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental Fate
13. Disposal considerations

Waste disposal methods
Improper disposal of excess pesticide, spray mixture, or rinsate is prohibited. If these wastes cannot be disposed of by use according to label instructions, contact appropriate disposal authorities for guidance.

Contaminated packaging
Containers must be disposed of in accordance with local, state and federal regulations. Refer to the product label for container disposal instructions.

14. Transport information

DOT
This material is not a hazardous material as defined by U.S. Department of Transportation at 49 CFR Parts 100 through 185.

Packaging Type
Non-Bulk, Bulk

TDG
Classification below is only applicable when shipped by vessel and is not applicable when shipped by road or rail only.

Proper shipping name
Environmentally hazardous substance, liquid, n.o.s.
Hazard Class
9
UN/ID No
UN3082
Packing group
III
Marine pollutant
Sulfentrazone.
Description
UN3082, Environmentally hazardous substance, liquid, n.o.s. (sulfentrazone), 9, PGIII, Marine pollutant

ICAO/IATA

UN/ID No
UN3082
Proper shipping name
Environmentally hazardous substance, liquid, n.o.s.
Hazard Class
9
Packing group
III
Marine pollutant
Sulfentrazone
Description
UN3082, Environmentally hazardous substance, liquid, n.o.s. (sulfentrazone), 9, PGIII, Marine pollutant

IMDG/IMO

Proper shipping name
Environmentally hazardous substance, liquid, n.o.s.
Hazard Class
9
UN/ID No
UN3082
Packing group
III
EmS No.
F-A, S-F
Marine pollutant
Sulfentrazone
Description
UN3082, Environmentally hazardous substance, liquid, n.o.s. (sulfentrazone), 9, PGIII, Marine pollutant
15. Regulatory information

U.S. Federal Regulations
SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>&lt;3</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories
- Acute Health Hazard: yes
- Chronic Health Hazard: yes
- Fire Hazard: no
- Sudden Release of Pressure Hazard: no
- Reactive Hazard: no

CERCLA

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Hazardous Substances RQs</th>
<th>Extremely Hazardous Substances RQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>1000 lb</td>
<td></td>
</tr>
</tbody>
</table>

TSCA Inventory (United States of America)

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>U.S. - TSCA (Toxic Substances Control Act) - Section 8(d) - 716.120(a) - Health and Safety Reporting - List of Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>10/04/1982</td>
</tr>
</tbody>
</table>

Mexico - Grade
- Slight risk, Grade 1

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Carcinogen Status</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td></td>
<td>Mexico: S*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: TWA 50 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: TWA 188 mg/m³</td>
</tr>
</tbody>
</table>

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.
WHMIS Hazard Class
- D2A Very toxic materials

16. Other information

Revision Date: 2012-01-19
Reason for revision: (M)SDS sections updated.
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Prepared By

FMC Corporation

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End of Material Safety Data Sheet