Define SC

MSDS Version 1.1

SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name	Define SC
Chemical Name	
Common Name	
MSDS Number	1872
Chemical Family	Heteroaryloxyacetamide
Chemical Formulation	
EPA Registration No.	264-819

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

For MEDICAL, TRANSPORTATION or Other EMERGENCY call 1-800-334-7577 24 hours/day
For Product Information call 1-866-99BAYER (1-866-992-2937)

Product Use Description Herbicide used for control of certain grass and broadleaf weeds in corn and other crops. The maximum use rate is approximately 1.9 lbs of the product per acre (0.77 lbs active per acre).

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS No.	Concentration % by Weight	
		Minimum	Maximum
Flufenacet Techncial	142459-58-3	39.7000	42.2000

SECTION 3. HAZARDS IDENTIFICATION

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

Emergency Overview Caution! Harmful if swallowed or absorbed through skin. Avoid contact with skin, eyes and clothing. Remove contaminated clothing and wash clothing before reuse.

Physical State Liquid
Suspension

Odor Slight Characteristic

Appearance Off-white

Immediate Effects

General	Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.
Ingestion	Harmful if swallowed.

SECTION 4. FIRST AID MEASURES

Eye	Rinse immediately with plenty of water and seek medical advice.
Skin	In case of contact, immediately wash with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes while washing. Clean contaminated clothing and shoes before re-use or discard if they cannot be thoroughly cleaned. Call a poison control center or doctor for treatment advice.
Ingestion	Immediately call a poison control center or doctor for treatment advice. Have person sip a glass of water if able to swallow. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Do not give anything by mouth to an unconscious person.
Inhalation	Remove victim from immediate source of exposure and assure that the victim is breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardio-pulmonary resuscitation). Seek medical attention.

Notes to physician

Treatment	No specific antidote is available. Treat the patient symptomatically.

SECTION 5. FIRE FIGHTING MEASURES

Flash Point	> 100 °C / > 212 °F Not Flammable
Auto Ignition Temperature	425 °C / 797 °F
Suitable Extinguishing Media	Water spray jet, Dry powder, Foam, Carbon dioxide (CO2), Dry sand
Fire Fighting Instructions	Dike area to prevent runoff and contamination of water sources.

SECTION 6. ACCIDENTAL RELEASE MEASURES

General and Disposal	Use proper protective equipment to minimize personal exposure (see Section 8).

	Clean up residual material by washing area with water. Dispose in accordance with all local, state/provincial and federal regulations.
Land Spill or Leaks	Isolate area and keep unauthorized people away. Carefully dam up spilled material to prevent runoff. Do not walk through spilled material. Absorb spilled material with absorbing type compounds for proper disposal.

SECTION 7. HANDLING AND STORAGE

Handling Procedures	Keep away from food and feed. Keep from freezing.
Storing Procedures	Keep in a dry, cool place.
Work/Hygienic Procedures	Keep working clothes separately. Wash hands before breaks and at the end of workday. Avoid contact with the skin and the eyes. Remove contaminated clothing.
Min/Max Storage Temperatures	Do not transport or store below -10 °C / 14 °F Do not transport or store above 40 °C / 104 °F

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye/Face Protection	Goggles
General Protection	Long-sleeved shirt and long pants. Shoes plus socks. Chemical-resistant gloves.
Exposure Limits	None Established

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Off-white
Physical State	Liquid Suspension
Odor	Slight Characteristic
pH	5.5 - 7.0

Density	1.2 g/cm3 at 20 °C
Solubility (in water)	Dispersible
Viscosity	600 - 1,200 mPa.s 20 °C

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal conditions.
Conditions to Avoid	Temperatures above 70°C. Unstable under basic conditions.
Incompatibility	Bases
Hazardous Products of Decomposition	Bay FOE 5043 N-Isomer; others unknown.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity studies have not been performed on this product as formulated. The acute toxicology information provided above is from a similar formulation, Tiara SC 500, containing a higher percentage of the active ingredient, flufenacet. The non-acute information pertains to flufenacet technical.

Acute Oral Toxicity	Rat: LD50: > 500 - < 1,000 mg/kg
Acute Dermal Toxicity	Rat: LD50: > 4,000 mg/kg
Acute Inhalation Toxicity	Male and Female Rat: LC50: > 2,172 mg/l 4 h Maximum technically attainable concentration; no mortality. Male and Female Rat: LC50: > 8,688 mg/l 1 h
Skin Irritation	Rabbit: Non-irritating.
Eye Irritation	Rabbit: Non-irritating.
Sensitization	Guinea pig: Non-sensitizing
Sub-Chronic Toxicity	In 3 month feeding studies in mice, rats, and dogs, the main target organs affected by exposure to flufenacet were brain, thyroid, liver, kidney, and spleen as indicated by changes in clinical chemistries, organ weights and/or histopathological findings. Alterations in circulating serum thyroid hormones (thyroxine and triiodothyronine) were observed in each species and were considered indicative of hepatic interference. Primary hematological parameters affected by treatment in each species included changes in erythrocytes, platelets, hemoglobin, and hemtocrit concentrations. Histopathological findings

generally correlated with alterations in organ weights. A decrease in body weight gain was observed in mice and rats.

In a subacute dermal toxicity study, rats were treated with flufenacet at doses of 20, 150, or 1000 mg/kg. Animals were treated for 6 hours/day such that males received 17 applications and females received 18 applications in a period of 21- and 22 days, repectively. An additional control and high-dose group were treated and maintained for a period of two weeks so as to ascertain the extent of recovery. Effects observed included decreased levels for thyroxine (T4) and free thyroxine (FT4), increased liver weights, and centrilobular hepatocytomegaly. The additional animals treated with 1000 mg/kg demonstrated a complete recovery. The no-observed-effect-level (NOEL) was 20 mg/kg.

Chronic Toxicity

Dogs were administered flufenacet at dietary concentrations of 40, 800 or 1600 ppm for 1 year. Effects observed included decreased terminal body weights, head tilt, computerized electrocardiography findings, quantitative electroencephalography findings, clinical neurological findings, organ weight differences, and changes in clinical chemistry and hematology parameters. Micropathological observations were noted in the liver, kidney, eye, brain, spinal cord and sciatic nerve. The NOEL was 40 ppm.

In a 2 year feeding study, rats were administered flufenacet at dietary concentrations of 25, 400 or 800 ppm. The toxicological response of the rat could be broadly characterized as involving structural and/or functional alterations in liver-, kidney-, hematologic/spleen-, and thyroid-related endpoints. Eye effects were also observed and included cataracts and ocular scleral mineralization. The NOEL was 25 ppm.

Assessment Carcinogenicity

Flufenacet was investigated for carcinogenicity in chronic feeding studies using mice and rats at maximum levels of 400 and 800 ppm, respectively. There was no evidence of a carcinogenic potential observed in either species.

ACGIH
None
NTP
None
IARC
None
OSHA
None

Reproductive & Developmental Toxicity

In a developmental toxicity study, rats were administered flufenacet by oral gavage during gestation at doses of 5, 25, or 125 mg/kg. The NOEL for both maternal and developmental toxicity was 25 mg/kg.

In a developmental toxicity study using rabbits, flufenacet was administered by oral gavage during gestation at doses of 5, 25, 125, or 200 mg/kg. The NOELs for maternal and developmental toxicity were 5 and 25 mg/kg, respectively.

	In a reproduction study using rats, flufenacet was administered at dietary concentrations of 20, 100, or 500 ppm for 2 generations. There were no compound-related effects on the adult reproductive or pup parameters. The NOELs for parental and reproductive toxicity were 20 and 500 ppm, respectively.
Neurotoxicity	In an acute neurotoxicity screening study using rats, flufenacet was administered as a single oral dose at doses of 75, 200, or 450 mg/kg for males and 75, 150, or 300 mg/kg for females. Compound-related deaths occurred at the high-dose for both sexes with all high-dose females dying within three days following treatment. All clinical signs and neurobehavioral effects observed were ascribed to acute systemic toxicity. Based on these results, the NOEL for neurotoxicity was 450 mg/kg for males and 150 mg/kg for females (the highest doses with survivors). The overall NOEL was 75 mg/kg for males and <75 mg/kg for females. In a subsequesnt study, an overall NOEL of 50 mg/kg was established for females. In a 13 week neurotoxicity screening study, flufenacet was administered to rats at dietary concentrations of 120, 600, or 3000 ppm. Effects observed at the high-dose included reduced body weights, reduced forelimb grip strength, slightly uncoordinated righting response, decreased body temperature, increased hindlimb footsplay, increased activity, and increased relative brain weight. Microscopic examinations revealed an increased incidence of axonal swelling in the brain and spinal cord tissues at the mid-and high-dose levels. The NOEL for subchronic neurotoxicity was 120 ppm based on microscopic lesions. In a one generation developmental neurotoxicity study, flufenacet technical was administered to rats at dietary concentrations of 20, 100, or 500 ppm during gestation and postnatal development. Maternal toxicity observed included decreased body weights and feed consumption. Effects observed in the offspring included decreased body weights, delayed development (eye opening and preputial separation) and changes in feed consumption. Fluefenacet did not cause any specific neurobehavioral effects in the offspring. The overall NOEL for both maternal and F1 offspring toxicity was 20 ppm.
Mutagenicity	In vivo and in vitro mutagenicity studies conducted on flufenacet have all been negative. Thus, flufenacet is not mutagenic.

SECTION 12. ECOLOGICAL INFORMATION

Acute and Prolonged Toxicity to Fish	Rainbow trout LC50: 5.84 mg/l Bluegill sunfish LC50: 2.13 mg/l
Toxicity to Aquatic Plants	Algae EC50: 0.031 mg/l
Acute Toxicity to Aquatic	Daphnia

Invertebrates	EC50: 30.9 mg/l
Environmental Precautions	This product must be strictly prevented from reaching waterways. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor runoff or drift.

SECTION 13. DISPOSAL CONSIDERATIONS

General Disposal Guidance	Wastes resulting from the 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 by incineration or, if allowed by State and Local authorities, by burning. If burned, stay out of smoke.
RCRA Classification	Not Regulated under this Statute

SECTION 14. TRANSPORT INFORMATION

TRANSPORTATION CLASSIFICATION:
Not Regulated for transportation

FREIGHT CLASSIFICATION:
Compounds, Tree or Weedkilling, N.O.I., other than poison, having a density of 20 LBS or greater per cubic foot

SECTION 15. REGULATORY INFORMATION

EPA Registration No. 264-819

US Federal Regulations

TSCA list
None

TSCA 12b export notification
None

SARA Title III - section 302 - notification and information
None

SARA Title III - section 313 - toxic chemical release reporting
None

US States Regulatory Reporting

CA Prop65
This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State right-to-know ingredients

None

Canadian Regulations

Canadian Domestic Substance List

None

Environmental

CERCLA

None

Clean Water Section 307 Priority Pollutants

None

Safe Drinking Water Act Maximum Contaminant Levels

None

International Regulations

EU Classification

Flufenacet Techncial	142459-58-3	Harmful Dangerous for the environment
R Phrases	Harmful if swallowed. May cause sensitization by skin contact. Harmful: danger of serious damage to health by prolonged exposure if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.	
S Phrases	Keep out of the reach of children. Keep away from food, drink and animal feedingstuffs. Avoid contact with the skin. Wear suitable 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)

None

SECTION 16. OTHER INFORMATION

	Health	Flammability	Reactivity	Others
NFPA	2	1	0	

Reason to Issue: Add EPA Registration Number; add NFPA codes.

Approval Date: 12/04/2003

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