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**In Case of Emergency, Call
 1-800-327-8633 (FAST MED)**

Date of MSDS Preparation (Y/M/D): 2005-12-31

Supersedes date (Y/M/D): 04-03-01

MSDS prepared by:
 Department of Regulatory & Biology Development
 Syngenta Crop Protection Canada, Inc.

For further information contact:
 1-87-SYNGENTA (1-877-964-3682)

SECTION – 1: PRODUCT IDENTIFICATION

Product Identifier: PRELUDE® 240 Formulation No.: A12860C
Registration Number: 26509 (Pest Control Products Act)
Chemical Class: A synthetic pyrethroid insecticide.
Synonym: None

Active Ingredient (%): Permethrin Technical (25.7%) CAS No.: 52645-53-1
Chemical Name : (3-phenoxyphenyl) methyl(+/-)cis/trans-3-(2,2-dichloro vinyl)-2,2-dimethylcyclopropanecarboxylate

Product Use: PRELUDE® is an emulsifiable concentrate product containing a synthetic pyrethroid insecticide that provides broad spectrum control of insect pests. For further details please refer to product label.

SECTION – 2 : COMPOSITION/INFORMATION ON INGREDIENTS

Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen	WHMIS†
Petroleum Solvent	Not Established	Not Established	100 ppm (525 mg/m ³) TWA (exposure limits for petroleum distillate – Stoddard solvent)*	No	Not Established
Permethrin Technical (25.7%)	Not Established	Not Established	10 mg/m ³ TWA***	IARC Group 3	Not Established

* Recommended by manufacturer
 *** Syngenta Occupational Exposure Limit (OEL)
 † Material listed in Ingredient Disclosure List under Hazardous Products Act.

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications. Syngenta Hazard Category: B.

SECTION – 3: HAZARDS IDENTIFICATION

Symptoms of Acute Exposure

Harmful if inhaled or swallowed. Dust, mist or vapour irritating to eyes and respiratory tract. May cause mild eye and skin irritation. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. May cause temporary itching, tingling, burning or numbness of exposed skin, called paresthesia.

Exposure to high vapor levels may cause headache, dizziness, numbness, nausea, incoordination, or other central nervous system effects.

Hazardous Decomposition Products

Can decompose at high temperatures and form toxic gases.

Physical Properties

Appearance: Clear straw-coloured liquid.

Odour: Aromatic.

Unusual Fire, Explosion and Reactivity Hazards

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

Potential Health Effects

Relevant routes of exposure: Skin, eyes, mouth, lungs.

SECTION – 4: FIRST AID MEASURES

IF POISONING IS SUSPECTED, immediately contact the poison information centre, doctor or nearest hospital. Have the product container, label or Material Safety Data Sheet with you when calling Syngenta, a poison control center or doctor, or going for treatment. Tell the person contacted the complete product name, and the type and amount of exposure. Describe any symptoms and follow the advice given. Call the Syngenta Emergency Line [**1-800-327-8633 (1-800-FASTMED)**], for further information.

EYE CONTACT: Immediately flush eyes with clean water, holding eyelids apart for a minimum of 20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta, a poison control center or doctor for treatment advice. Obtain medical attention immediately if irritation persists.

SKIN CONTACT: Immediately remove contaminated clothing and wash skin, hair and fingernails thoroughly with soap and water. Flush skin with running water for a minimum of 20 minutes. Obtain medical attention if irritation occurs.

INHALATION: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is laboured, give oxygen. Obtain immediate medical attention.

INGESTION: If swallowed, immediately contact Syngenta, a poison control centre, doctor or nearest hospital for treatment advice. Provided the patient is conscious, wash out mouth with water. Do not give anything by mouth to an unconscious person. Do not induce vomiting unless directed by a physician or a poison control center. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer water.

NOTES TO PHYSICIAN:

There is no specific antidote if this product is ingested. Skin contact paresthesia effects (itching, tingling, burning or numbness) are transient, lasting up to 24 hours. Treat symptomatically.

Contains petroleum distillate - vomiting may cause aspiration pneumonia.

MEDICAL CONDITIONS KNOWN TO BE AGGRAVATED:

None known.

SECTION – 5: FIRE FIGHTING MEASURES

Flash point and method: > 100 °C (Setaflash).

Upper and lower flammable (explosive) limits in air: Not available.

Auto-ignition temperature: Not available.

Flammability: Not flammable.

Hazardous combustion products: During a fire, irritating and possible toxic gases may be generated by thermal decomposition or combustion.

Conditions under which flammability could occur: Product is not flammable. Keep fire exposed containers cool by spraying with water.

Extinguishing media: Use foam, carbon dioxide, dry powder, halon extinguishant or water fog or mist, (avoid use of water jet). Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. Contain run-off water with, for example, temporary earth barriers.

Sensitivity to explosion by mechanical impact: No.

Sensitivity to explosion by static discharge: No.

SECTION – 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Make sure all personnel involved in the spill cleanup follow good industrial hygiene practices. A small spill can be handled routinely. Wear suitable protective clothing and eye protection to prevent skin and eye contact. Use adequate ventilation and wear an air-supplied respirator to prevent inhalation.

Procedures for dealing with release or spill: Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Sections 7 and 8. Pump or scoop large amounts of liquid into a disposable container. Absorb remaining liquid or smaller spills with clay, sand or vermiculite. Scoop or sweep up material and place into a disposal container. Wash area with detergent and water. Pick up wash liquid with additional absorbent and place into compatible disposal container. On soils, skim off the upper contaminated layer and collect for disposal. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition. Spillages or uncontrolled discharges into watercourses must be alerted to the appropriate regulatory body.

SECTION – 7: HANDLING AND STORAGE

Handling practices: KEEP OUT OF REACH OF CHILDREN and animals. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. After work, rinse gloves and remove protective equipment. Wash hands thoroughly with soap and water after handling, and before eating, tobacco use, drinking, or using the toilet. Wash contaminated clothing before re-use and separate from household laundry. Keep containers closed when not in use. Keep product, wash or rinse water, and contaminated materials out of water, away from crops, and away from access by people, animals and birds.

Appropriate storage practices/requirements: Store in original container only in a well-ventilated, cool, dry, secure area. Protect from heat, sparks and flame. Do not expose sealed containers to temperatures above 40 °C and prevent product from freezing. Keep separate from other products to prevent cross contamination. Rotate stock. Clean up spilled material immediately.

National Fire Code classification: Not applicable.

SECTION – 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Applicable control measures, including engineering controls: This product is intended for use outdoors where engineering controls are not necessary. If necessary, ensure work areas have ventilation, containment, and procedures sufficient to maintain airborne levels below the TLV. Warehouses, production area, parking lots and waste holding facilities must have adequate containment to prevent environmental contamination. Provide separate shower and eating facilities.

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, PACKAGING AND USE OF THIS PRODUCT.

FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.

Personal protective equipment for each exposure route:

General: Avoid breathing dust, vapours or aerosols. Avoid contact with eye, skin and clothing. Wash thoroughly after handling and before eating, drinking, or handling tobacco.

INGESTION: Do not eat, drink, handle tobacco, or apply cosmetics in areas where there is a potential for exposure to this material. Always wash thoroughly after handling.

EYES: Where eye contact is likely, use chemical splash goggles. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

SKIN: Where contact is likely, wear chemical-resistant gloves (such as nitrile or butyl), coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.

INHALATION: A respirator is not normally required when handling this substance. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below exposure limits. A NIOSH-certified combination air-purifying respirator with an N, P or R 95 or HE class filter and an organic vapor cartridge may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a pressure demand atmosphere-supplying respirator if there is any potential for uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection.

SECTION – 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear straw-coloured liquid.
Formulation Type: Emulsifiable concentrate.
Odour: Aromatic.
pH: 6 - 7 (1% solution in water).
Vapour pressure and reference temperature: < 1.0 mmHg @ 20 °C (Permethrin Technical).
Vapour density: Not available.
Boiling point: > 80 °C.
Melting point: Not available.
Freezing point: ≤ -26 °C
Specific gravity or density: 0.96 g/cm³.
Evaporation Rate: Not available.
Water/oil partition coefficient: Not available.
Odour threshold: Not available.
Viscosity: 8.9 cps @ 21 °C.
Solubility in Water: Insoluble (Permethrin Technical).

SECTION – 10: STABILITY AND REACTIVITY

Chemical stability: Stable under normal use and storage conditions.
Conditions to avoid: None known.
Incompatibility with other materials: Strong oxidizing agents.
Hazardous decomposition products: Can decompose at high temperatures forming toxic gases.
Hazardous polymerization: Will not occur.

SECTION – 11: TOXICOLOGICAL INFORMATION

Acute toxicity/Irritation Studies (Finished Product):

Ingestion:	<u>Slightly Toxic</u>	
	Oral (LD50 Rat):	3,268 mg/kg body weight
Dermal:	<u>Slightly Toxic</u>	
	Dermal (LD50 Rabbit):	> 2,000 mg/kg body weight
Inhalation:	<u>Practically Non-Toxic</u>	
	Inhalation (LC50 Rat):	2.05 mg/L air - 4 hours
Eye Contact:	<u>Mildly Irritating (Rabbit)</u>	
Skin Contact:	<u>Mildly Irritating (Rabbit)</u>	
Skin Sensitization:	<u>Not a Sensitizer (Guinea Pig)</u>	

Neurotoxicity

Permethrin Technical: Neurotoxicity was observed in the one-year dog study at high dose levels (1,800 mg/kg/day). No delayed neurotoxicity data are available.

Reproductive/Developmental Effects

Permethrin Technical: Permethrin had no effect on the reproductive performance of rats bred over 3 generations when fed to them at diet levels up to and including 2500 ppm. Permethrin gave a non-mutagenic response, both in the absence and presence of S9, in all 5 *Salmonella typhimurium* strains.

Chronic/Subchronic Toxicity Studies

Permethrin Technical: The lowest NOAEL/NOEL that has been established is 5 mg/kg/day (one-year dog study). Neurotoxicity at high dose levels and adaptive liver changes were observed.

Carcinogenicity

Permethrin Technical: No carcinogenic effects have been observed for permethrin in chronic toxicity testing with rats, mice and dogs.

Other Toxicity Information:

In humans, contact with exposed skin may result in temporary itching, tingling, burning or numbness, called paresthesia. The effect may result from splash, aerosol, or hot vapor contact, or transfer to the face from contaminated gloves and hands. The symptoms normally disappear within 24 hours. Face and genital areas are especially susceptible to this effect. Paresthesia involving the face is also known as "subjective facial sensation" or SFS.

This material is unlikely to produce vapor or mist in transportation and be hazardous by inhalation.

Toxicity of Other Components

The acute toxicity test results reported in Section 11, above, for the finished product take into account any acute hazards related to the "other components" in the formulation.

Petroleum Solvent:

The supplier reports that high vapor concentrations (over 700 ppm) may irritate eyes, respiratory tract and may cause central nervous system effects such as headache, dizziness, or anesthesia. Prolonged or repeated skin exposure can cause defatting, resulting in dermatitis. Laboratory animal studies have shown that prolonged and repeated inhalation exposure to light hydrocarbon vapors in the same naphtha boiling range as this solvent can produce adverse kidney effects in male rats. These effects were not observed in female rats or male and female mice. In a number of human studies, there was no clinical evidence of such effects at normal occupational levels.

Other materials that show synergistic toxic effects together with the product: None known.

Target Organs

Active Ingredient

Permethrin Technical: CNS, skin, eye, upper respiratory system.

Inert Ingredients

Petroleum Solvent: CNS, respiratory tract, skin.

SECTION – 12: ECOLOGICAL INFORMATION

Summary of Effects

PRELUDE is an emulsifiable concentrate product containing a synthetic pyrethroid insecticide that provides broad spectrum control of insect pests. The active ingredient, permethrin, is highly toxic to insects (bees), aquatic invertebrates (water flea), and fish, but practically nontoxic to birds.

Eco-Acute Toxicity

Permethrin Technical:

Bees LC ₅₀ /EC ₅₀	0.11 µg/bee
Invertebrates (<i>Daphnia magna</i>) 48-hour LC ₅₀ /EC ₅₀	0.6 µg/L
Fish (Rainbow Trout) 96-hour LC ₅₀ /EC ₅₀	2.5 µg/L
Fish (Rainbow Trout) 48-hour LC ₅₀ /EC ₅₀	1.8 µg/L
Fish (Bluegill) 48-hour LC ₅₀ /EC ₅₀	1.8 µg/L
Japanese Quail Oral LD ₅₀	>13,500 mg/kg
Mallard Oral LD ₅₀	> 9,800 mg/kg

Eco-Chronic Toxicity

Permethrin Technical:

Not available.

Environmental Fate

The active ingredient, permethrin, has a low bioaccumulation potential and low persistence in soil and water. The dissipation half-life in soil is <38 days. It is non-volatile and very little residue is present in air after application. Permethrin is strongly absorbed by the soil and will not leach into the ground after application. The main route of degradation is by microbial degradation and formation of bound residues. No persistent or toxic degradation products are formed.

SECTION – 13: DISPOSAL CONSIDERATIONS

Waste disposal information: Do not reuse empty containers. Empty container retains product residue. Triple rinse, or equivalent, empty container, return rinse water to dilution mixture, and dispose of dilution mixture as a hazardous waste if it cannot be disposed of by use according to label instructions. Dispose of empty containers in accordance with local regulations. Consult provincial environment ministry for advice on waste disposal. Industrial/commercial waste may be handled at licensed facilities only. Waste shipments must be securely packaged and properly labelled. Only licensed carriers may be used, and proper documents must accompany the shipment.

SECTION – 14 : TRANSPORT INFORMATION

Shipping information such as shipping classification:

TRANSPORTATION OF DANGEROUS GOODS CLASSIFICATION - ROAD/RAIL

Not Regulated

SECTION – 15: REGULATORY INFORMATION

WHMIS classification for product: Exempt

A statement that the MSDS has been prepared to meet WHMIS requirements, except for use of the 16 headings.

This MSDS has been prepared in accordance with WHMIS requirements, but the data are presented under 16 headings.

Other regulations; restrictions and prohibitions

Pest Control Products (PCP) Act Registration No.: 26509

SECTION – 16: OTHER INFORMATION

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Syngenta will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years. This product is under the jurisdiction of the Pest Control Products Act and is exempt from the requirements for a WHMIS compliant

MSDS. Hazardous properties of all ingredients have been considered in the preparation of this MSDS. Read the entire MSDS for the complete hazard evaluation of this product.

Prepared by: Syngenta Crop Protection Canada, Inc.
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