

SAFETY DATA SHEETS

This SDS packet was issued with item:

078071419

The safety data sheets (SDS) in this packet apply to one or more components included in the items listed below. Items listed below may require one or more SDS. Please refer to invoice for specific item number(s).

078249469



Merck Animal Health
One Merck Dr.
Whitehouse Station, NJ 08889

MATERIAL SAFETY DATA SHEET

Merck Animal Health urges each user or recipient of this MSDS to read the entire data sheet to become aware of the hazards associated with this material.

SECTION 1. IDENTIFICATION OF SUBSTANCE AND CONTACT INFORMATION

MSDS NAME: Atroban 42.5%

SYNONYM(S): Atroban 42.5% EC

MSDS NUMBER: SP000811

EMERGENCY NUMBER(S): (908) 423-6000 (24/7/365) English Only

Transportation Emergencies - CHEMTREC:
(800) 424-9300 (Inside Continental USA)
(703) 527-3887 (Outside Continental USA)

Rocky Mountain Poison Center (For Human Exposure):
(303) 595-4869

Animal Health Technical Services:
For Animal Adverse Events: Small Animals and Horses: (800) 224-5318
For Animal Adverse Events: Livestock: (800) 211-3573
For Animal Adverse Events: Poultry: (800) 219-9286

INFORMATION: Animal Health Technical Services:
For Small Animals and Horses: (800) 224-5318
For Livestock: (800) 211-3573
For Poultry: (800) 219-9286

MERCK MSDS HELPLINE: (800) 770-8878 (US and Canada)
(908) 473-3371 (Worldwide)
Monday to Friday, 9am to 5pm (US Eastern Time)

SECTION 2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Free-flowing liquid
Yellow
Aromatic odor
Flammable.
Corrosive to skin, eyes, or mucous membranes.
May cause sensitization by inhalation or skin contact.
May be an aspiration hazard if ingested.
Harmful if swallowed.
May be harmful by inhalation.
May cause effects to:
nervous system
gastrointestinal tract
cardiovascular system
respiratory system
Extremely toxic to fish and aquatic organisms.

POTENTIAL HEALTH EFFECTS:

The toxicological properties of the mixture(s) have not been fully characterized in humans or animals. However, there are data to describe the toxicological properties of the individual ingredients. The following summary is based upon available information about the individual ingredients of the mixture(s), or of the expected properties of the mixture(s). Only information about the ingredients that are expected to contribute significantly to the potential health hazard profile of the formulation(s) are presented.

Atroban 42.5% is an insecticide for use on farm animals or as a premise treatment. This product has been determined to be corrosive to the skin and eyes.

This product contains permethrin, a synthetic Type I pyrethroid ester. Occupational exposure to permethrin has induced temporary skin and facial sensations (feelings of numbness and tingling). Workers exposed to permethrin have also reported irritative symptoms, such as itching and burning of the skin, itching and irritation of the eyes, and irritation of the upper respiratory tract as well as increased nasal secretions. Anaphylactic reactions including bronchospasm and shock may occur in very sensitive individuals. Ingestion of large amounts may cause central nervous system effects resulting in seizures, coma, and respiratory arrest.

Ingestion of pyrethroid esters has caused stomach pain, nausea and vomiting, headache, dizziness, numbness and tingling, anorexia, fatigue, tremors, and intermittent convulsions.

Xylene vapor is an irritant of the eyes, mucous membranes, respiratory tract and skin. Breathing of fumes may cause hydrocarbon pneumonitis; ingestion may cause gastrointestinal distress (vomiting and diarrhea) and aspiration to the lungs leading to chemical pneumonitis, pulmonary edema, and hemorrhage. Acute inhalation exposure to xylene may cause lightheadedness, euphoria, nausea, and headache; exposure to high concentrations may rapidly cause dizziness, weakness, anxiety, decreased concentration, impaired memory, slurred speech, fatigue, loss of balance, delirium, agitation, noise sensitivity, disturbed vision, tremors, salivation, changes of heartbeat, cardiac stress, CNS depression, respiratory difficulties, sensitization of the heart, coma or death. Repeated or prolonged exposure to xylene may cause similar effects to those seen following acute exposure; however, effects are generally more severe. It has been shown that xylene crosses the placenta; however, effects to the unborn fetus are unknown. Developmental effects have been observed in animals at maternally toxic doses.

Ethylbenzene may cause skin, eye, and respiratory tract irritation. Ethylbenzene is a an aspiration hazard; if aspirated, ethylbenzene may cause fatal chemical pneumonitis. At high concentrations, ethylbenzene may cause CNS depression including headache, nausea, vomiting, weakness, dizziness, sleepiness, loss of coordination, judgement and consciousness, coma, and death. Prolonged exposure to ethylbenzene may cause upper respiratory tract, blood, and liver disorders.

LISTED CARCINOGENS

INGREDIENT	CAS NUMBER	OSHA	IARC	NTP	ACGIH
Ethylbenzene	100-41-4		2B		A3

Permethrin technical is classified by IARC as a Group 3 carcinogen (unclassifiable as to carcinogenicity in humans).

Xylene is classified by IARC as a Group 3 carcinogen (unclassifiable as to carcinogenicity in humans).

SECTION 3. COMPOSITION AND INFORMATION ON INGREDIENTS

PRODUCT USE: Veterinary product

MSDS NAME: Atroban 42.5%

MSDS NUMBER: SP000811

Latest Revision Date: 23-Sep-2011

Page 2 of 8

CHEMICAL FORMULA: Mixture.

The formulation for this product is proprietary information. Only hazardous ingredients in concentrations of 1% or greater and/or carcinogenic ingredients in concentrations of 0.1% or greater are listed in the Chemical Composition table. Active ingredients in any concentration are listed. For additional information about carcinogenic ingredients see Section 2.

CHEMICAL COMPOSITION

INGREDIENT	CAS NUMBER	PERCENT
Permethrin Technical	52645-53-1	42.5
Xylene	1330-20-7	40-50
Ethylbenzene	100-41-4	<10
Calcium alkylbenzenesulfonate	70528-83-5	<10
Alkoxylated alkylphenol	127087-87-0	<10

ADDITIONAL INFORMATION: This MSDS is written to provide health and safety information for individuals who will be handling the final product formulation during research, manufacturing, and distribution. For health and safety information for individual ingredients used during manufacturing, refer to the appropriate MSDS for each ingredient. Refer to the package insert or product label for handling guidance for the consumer.

SECTION 4. FIRST AID MEASURES

INHALATION: Remove to fresh air. If any trouble breathing, get immediate medical attention. Administer artificial respiration if breathing has ceased. If irritation or symptoms occur or persist, consult a physician.

SKIN CONTACT: In case of skin contact, IMMEDIATELY flush exposed skin thoroughly with plenty of water. While wearing protective gloves, remove any contaminated clothing, including shoes and continue to wash skin thoroughly with soap and water for at least 15 minutes. Get IMMEDIATE medical attention.

EYE CONTACT: In case of eye contact, IMMEDIATELY rinse eyes thoroughly with plenty of water. If wearing contact lenses, remove only after initial rinse, and continue rinsing eyes for at least 15 minutes. Get IMMEDIATE medical attention.

INGESTION: DO NOT induce vomiting. Do not attempt to give anything by mouth to a seizing, drowsy or unconscious person. If alert, rinse mouth, drink a glass of water and IMMEDIATELY consult a physician.

NOTE TO PHYSICIAN: This product is a permethrin insecticide and contains petroleum distillates. Vomiting is contraindicated due to the possibility of aspiration pneumonia.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABILITY DATA:

Flash Point: 28.9 deg C (84 deg F) Method: Pensky-Martens closed-cup tester

Flammability (solid, gas): Flammable.

SPECIAL FIRE FIGHTING PROCEDURES:

Wear full protective clothing and self-contained breathing apparatus (SCBA).

SUITABLE EXTINGUISHING MEDIA:

Carbon dioxide (CO₂), extinguishing powder or water spray.

See Section 9 for Physical and Chemical Properties.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Wear appropriate personal protective equipment as specified in Section 8. Keep personnel away from the clean-up area.

SPILL RESPONSE / CLEANUP:

All spills should be handled according to site requirements and based on precautions cited in the MSDS. In the case of liquids, use proper absorbent materials. For laboratories and small-scale operations, incidental spills within a hood or enclosure should be cleaned by using a HEPA filtered vacuum or wet cleaning methods as appropriate. For large dry or liquid spills or those spills outside enclosure or hood, appropriate emergency response personnel should be notified. In manufacturing and large-scale operations, HEPA vacuuming prior to wet mopping or cleaning is required.

MSDS NAME: Atroban 42.5%

MSDS NUMBER: SP000811

Latest Revision Date: 23-Sep-2011

Page 3 of 8

ENVIRONMENTAL PRECAUTIONS:

This product is very toxic to aquatic organisms. Do not allow product to reach ground water, water course, sewage or drainage systems.

See Sections 9 and 10 for additional physical, chemical, and hazard information.

SECTION 7. HANDLING AND STORAGE**HANDLING:**

Avoid contact with skin, eyes, and mucosa. Ensure adequate ventilation. Handle in essentially closed systems, or in a laboratory fume hood. Cover containers during material transfer or transportation.

STORAGE:

Keep away from heat, sparks, open flames, and direct sunlight. Store in a cool, dry, well ventilated area.

See Section 8 for exposure controls and additional safe handling information.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION**EXPOSURE CONTROLS**

For laboratories and small-scale operations, essentially no open handling. Open handling of small quantities may be performed if there is no potential for dust or aerosol generation. For larger quantities or materials that may become airborne, materials should be handled in a properly functioning chemical fume hood, ventilated enclosure or controlled by local exhaust ventilation.

For manufacturing and large-scale operations, essentially no open handling. Open handling is limited to small quantities in appropriately ventilated, enclosed environments. For larger quantities or materials that may become airborne, enclosed processes and the use of containment technology are preferred. Recirculation of general ventilation or local exhaust ventilation is not permitted unless appropriate scrubbing or filtration of incoming recirculated air is controlled.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):**Respiratory Protection:**

In laboratories and small-scale operations, appropriate respiratory protection is required in situations where exposure (e.g. spills, process upsets, or non-routine maintenance) may exceed any available recommended exposure limit. Consult your site safety staff for additional guidance.

In manufacturing and large-scale operations, powered air purifying respirators (PAPRs) or positive-pressure air supplied respirators with full-face coverage may be required dependent on the level of exposure. Appropriate respiratory protection is required in situations where exposure (e.g. spills, process upsets, or non-routine maintenance) may exceed any available recommended exposure limit. Consult your site safety staff for guidance.

Skin Protection:

Gloves that provide an appropriate barrier to the skin are recommended if there is potential for contact with this material. Consult your site safety staff for guidance.

Eye Protection:

Safety glasses with side shields. Use of goggles or full face protection may be required based on hazard, potential for contact, or level of exposure. Consult your site safety staff for guidance.

Body Protection:

In small-scale or laboratory operations, lab coats or equivalent protection is required. Disposable Tyvek or other dust impermeable suit should be considered based on procedure or level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance.

In large-scale or manufacturing operations, disposable Tyvek or other dust impermeable suit is recommended and based on level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance.

EXPOSURE LIMIT VALUES

INGREDIENT	CAS NUMBER	ACGIH TLV (TWA)	OSHA PEL (TWA)
Xylene	1330-20-7	100 ppm	100 ppm 435 mg/m ³
Ethylbenzene	100-41-4	20 ppm	100 ppm 435 mg/m ³

INGREDIENT	CAS NUMBER	ACGIH TLV (STEL / SKIN)	ACGIH TLV (CEIL)	OSHA PEL (STEL / SKIN)	OSHA PEL (CEIL)
Xylene	1330-20-7	150 ppm			

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

FORM: Free-flowing liquid
COLOR: Yellow
ODOR: Aromatic odor
SPECIFIC GRAVITY: 1.032
SOLUBILITY:
 Water: Emulsifiable

See Section 5 for flammability/explosivity information.

SECTION 10. STABILITY AND REACTIVITY

STABILITY/ REACTIVITY:
 Stable under normal conditions.

INCOMPATIBLE MATERIALS / CONDITIONS TO AVOID:
 Keep away from heat, sparks, open flame, and direct sunlight. Oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS / REACTIONS:
 Carbon oxides (COx). Nitrogen oxides (NOx). Sulfur dioxide (SO2). Halogens. Halogen acids.

SECTION 11. TOXICOLOGICAL INFORMATION

The toxicological properties of the mixture(s) have not been fully characterized in humans or animals. The information presented below pertains to the formulated product unless indicated otherwise.

ACUTE TOXICITY DATA

PRODUCT / CHEMICAL NAME	EXPOSURE ROUTE	STUDY DESCRIPTION	RESULT
Atroban 42.5%	Inhalation	LC50 (rat)	>18.6 mg/L/4hr
	Dermal	LD50 (rabbit)	10,000 mg/kg
	Oral	LD50 (rat)	1430 to 1580 mg/kg
	Skin	Skin Irritation (human)	Corrosive
		Skin Irritation (rabbit)	Corrosive
	Eye	Eye Irritation (human)	Corrosive
		Eye Irritation (rabbit)	Corrosive

INHALATION:
 Rats exposed to 18.6 mg/L for four hours exhibited signs of toxicity including inactivity, discharge around the eyes, nasal and muzzle areas, tremors, and ataxia. Gross necropsy findings included abnormal appearance of the lungs, liver, and kidney.

SKIN:
 Atroban 42.5% caused blanching of rabbit skin; histological examination revealed the presence of necrotic tissue at the application site.

Alkoxyated alkylphenol is a moderate to severe skin irritant.

EYE:
 Calcium alkylbenzenesulfonate is a severe eye irritant to rabbits.

Alkoxyated alkylphenol is a moderate to severe eye irritant.

ORAL:
 Signs of toxicity observed in rats exposed to Atroban 42.5% included body tremors and urinary incontinence. Signs of toxicity noted in mice exposed to Atroban 42.5% included hyperactivity, tremors, clonic convulsions, and urinary incontinence.

DERMAL AND RESPIRATORY SENSITIZATION:
 Permethrin: Moderate skin sensitizer in animals.

Ethylbenzene was not a skin sensitizer in human volunteers.

REPEAT DOSE TOXICITY DATA

MSDS NAME: Atroban 42.5%

MSDS NUMBER: SP000811

Latest Revision Date: 23-Sep-2011

Page 5 of 8

SUBCHRONIC / CHRONIC TOXICITY:

In sub-chronic studies ranging from 14 days to 26 weeks, rats and mice were treated with oral dosages of permethrin up to 10,000 mg/kg. Dose-dependent effects such as an increase in liver/body weight ratio, hypertrophy of the liver, and clinical signs of poisoning such as tremor were observed. The no-observed effects-level (NOEL) in rats ranged from 20 mg/kg diet (in studies lasting 90 days or 6 months) to 1500 mg/kg diet (in a 6-month study). Chronic studies ranging from 1 to 2 years were conducted in rats, mice and dogs. Dosages varied with species ranging from 1 mg/kg/day to 375 mg/kg/day of permethrin. Target organs of toxicity were the liver (increased liver weight and hepatocellular swelling), lung (increased weight), and testes (decreased weight). Depression and increased mortality were observed in mice at 75 mg/kg/day and above. Additional signs and symptoms of toxicity in the rat include hyperexcitation, sparring behavior, aggressiveness, enhanced startle response, whole body tremor and prostration.

Rats and rabbits exposed to mixed xylenes at doses of 690 ppm for 4 months and 1200 ppm for 40 to 130 days, respectively, exhibited hind limb paralysis, weight loss, decreased leukocyte count, alterations in clinical parameters, bone marrow hyperplasia as well as congestion of the heart, liver, adrenals, lungs, kidneys, and spleen.

Slight increases in kidney and liver weights in rats exposed to 400 ppm or 408 to 680 mg/kg/day ethylbenzene for 186 days. There were no effects in rabbits, guinea pigs, and monkeys exposed to concentrations up to 2200 ppm in sub-chronic studies up to six months.

REPRODUCTIVE / DEVELOPMENTAL TOXICITY:

In a three-generation reproductive study with permethrin, rats were administered doses ranging from 25 to 125 mg/kg/day. Systemic effects observed in the offspring were seen in the liver (hepatocyte hypertrophy and eosinophilia) and eye (infantile glaucoma). Body tremors were observed in the parents and offspring at 125 mg/kg/day. No teratogenic effects, maternal toxicity or fetotoxicity were observed in rats and rabbits administered 200 and 400 mg/kg/day, respectively, of permethrin.

Exposure to 50 and 500 mg/m³ xylene in rats (maternally toxic doses) caused embryotoxicity (increases in post-implantation losses) and teratogenic effects (skeletal, brain, liver, and heart abnormalities).

Fertility and pregnancy indices were unremarkable in male and female rats inhaling 60 to 500 ppm xylene for 131 days during pre-mating, mating, gestation, and lactation.

Ethylbenzene was not embryotoxic in rabbits exposed by inhalation at 100 or 1000 ppm. In rats exposed to the same concentrations, there was a significant increase in the incidence of extra ribs in the high dose group; however, maternal toxicity was evident in this group. Inhalation of 2600 mg/m³ (600 ppm) caused degeneration of the germinal epithelium in the testes of rabbits and monkeys but not of rats.

MUTAGENICITY / GENOTOXICITY:

Permethrin was negative in a bacterial mutagenicity study (Ames) and in a mammalian mutagenicity study (mouse lymphoma).

Mixed xylenes were negative in a wide variety of genotoxic assays including bacterial mutagenicity assays, a chromosome aberration studies, and in a rat bone marrow clastogenicity assay.

CARCINOGENICITY:

This material or product has not been evaluated for carcinogenicity.

Six carcinogenicity assays, three each in mice and rats, were conducted with permethrin. No tumorigenicity was seen in rat studies. However, species specific increases in pulmonary adenomas, a common benign tumor of mice with a high spontaneous background incidence, were seen in the three mouse studies. In one of these studies, there was an increased incidence of pulmonary alveolar cell carcinomas and benign liver adenomas when permethrin was administered in the diet at 5,000 ppm.

There was no evidence of carcinogenicity in rats exposed to xylene at doses ranging from 250 to 500 mg/kg for 5 days/week for 103 weeks.

In a lifetime inhalation study, rats and mice exposed to high concentrations (750 ppm) of ethylbenzene exhibited increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. However, these effects were not observed in animals exposed to lower concentrations (75 ppm and 250 ppm).

SECTION 12. ECOLOGICAL INFORMATION

There are no data for the final product or its formulation(s). The information presented below pertains to the following ingredient(s).

ECOTOXICITY DATA**INGREDIENT ECOTOXICITY**

Permethrin: 96-hr LC50 (rainbow trout): 0.1 to 314 ug/L
Permethrin: 96-hr LC50 (brook trout): 2.3 to 5.2 ug/L
Permethrin: 96-hr LC50 (channel catfish): 1.1 ug/L
Permethrin: 48-hr EC50 (daphnid): 0.2 to 22 ug/L

Xylene: 96-hr LC50 (rainbow trout): 13.5 mg/L

ENVIRONMENTAL DATA**OTHER INGREDIENT ENVIRONMENTAL DATA:**

Permethrin is readily biodegradable.

MSDS NAME: Atroban 42.5%

MSDS NUMBER: SP000811

Latest Revision Date: 23-Sep-2011

Page 6 of 8

SECTION 13. DISPOSAL CONSIDERATIONS

MATERIAL WASTE:

Disposal must be in accordance with applicable federal, state/provincial, and/or local regulations. Incineration is the preferred method of disposal, when appropriate. Operations that involve the crushing or shredding of waste materials or returned goods must be handled to meet the recommended exposure limit(s).

PACKAGING AND CONTAINERS:

Disposal must be in accordance with applicable federal, state/provincial, and/or local regulations.

SPECIAL ENVIRONMENTAL HANDLING PROCEDURES:

Do not allow product to reach ground water, water courses, sewage or drainage systems.

SECTION 14. TRANSPORT INFORMATION

Consult current regulatory guidelines for the appropriate transportation classification and labeling of this material. Refer to site-specific procedures and requirements for additional guidance.

DOT CLASSIFICATION:

Proper Shipping Name: Flammable liquids, n.o.s. (xylene, ethylbenzene)
Hazard Class: 3
UN Number: UN 1993
Packing Group: III

IATA/ICAO CLASSIFICATION:

Proper Shipping Name: Flammable liquids, n.o.s. (xylene, ethylbenzene)
Hazard Class: 3
UN Number: UN 1993
Packing Group: III

ADR CLASSIFICATION:

Proper Shipping Name: Flammable liquids, n.o.s. (xylene, ethylbenzene)
Hazard Class: 3
UN Number: UN 1993
Packing Group: III

IMDG/IMO CLASSIFICATION:

Proper Shipping Name: Flammable liquids, n.o.s. (xylene, ethylbenzene)
Hazard Class: 3
UN Number: UN 1993
Packing Group: III

SECTION 15. REGULATORY INFORMATION

TSCA LISTING

INGREDIENT	TSCA
Xylene	X
Ethylbenzene	X
Calcium alkylbenzenesulfonate	X
Alkoxylated alkylphenol	X

U.S. STATE REGULATIONS

INGREDIENT	California Proposition 65	CARTK	NJRTK	CTR TK	MARTK
Permethrin Technical			3422		X
Xylene		X	2014		X
Ethylbenzene	C	X	0851		X

INGREDIENT	PARTK	MNRTK	MIRTK	RIRTK
Xylene	X	X	X	X
Ethylbenzene	X	X		X

MSDS NAME: Atroban 42.5%

MSDS NUMBER: SP000811

Latest Revision Date: 23-Sep-2011

Page 7 of 8

SECTION 16. OTHER INFORMATION

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequence of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

DEPARTMENT ISSUING MSDS:

Global Safety & the Environment
Merck & Co., Inc.
One Merck Drive
Whitehouse Station, NJ 08889

MERCK MSDS HELPLINE:

(800) 770-8878 (US and Canada)
(908) 473-3371 (Worldwide)
Monday to Friday, 9am to 5pm (US Eastern Time)

MSDS CREATION DATE:

14-Aug-1998

SUPERSEDES DATE:

21-Mar-2008

SECTIONS CHANGED (US SUBFORMAT):

1, 16

SIGNIFICANT CHANGES (US SUBFORMAT):

Phone Number(s), OEB