

MATERIAL SAFETY DATA SHEET

SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

Product identifier: NUANCE HERBICIDE

Product use: Herbicide.

Supplier's name and address:

Cheminova Inc.

One Park Drive, Suite 150
Research Triangle Park, NC USA
27709

Phone #: (919) 474-6600 (8 AM to 5:00 PM EST, Monday to Friday)

Emergency Telephone #: 1-866-303-6950 (Medical Emergencies)
1-800-424-9300 (24 Hr. Chemtrec Number)

Manufacturer's name and address:

Cheminova A/S.
P.O. Box 9
DK-7620 Lemvig
Denmark

MSDS Prepared by: Cheminova Inc.

MSDS Preparation date: December 23, 2009

SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredients</u>	<u>CAS #</u>	<u>% (weight)</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>
Tribenuron-Methyl Technical (98%)	101200-48-0	60 - 100	N/Av	N/Av
Sulfonated lignin	Proprietary	1 - 5	N/Av	N/Av
Sulfonated aromatic polymer, sodium salt	Proprietary	1 - 5	N/Av	N/Av
Alkylnaphthalenesulfonate, sodium salt	Proprietary	1 - 5	N/Av	N/Av
Calcium Carbonate	1317-65-3	1 - 5	10 mg/m ³	15mg/m ³ (total dust) 5mg/m ³ (resp. fraction)

OSHA information: This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).

SECTION 3 — HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Beige solid. Odorless.

Warning! May cause eye and skin irritation. May cause irritation to the mouth, throat and stomach.
Causes respiratory irritation. May be dangerous for the environment. This product is harmful to plants.

POTENTIAL HEALTH EFFECTS

Target organs: Eyes, skin, respiratory system, digestive system.

Signs and symptoms of short-term (acute) exposure:

Inhalation: Dusts may cause moderate to severe irritation of the nose, throat and upper respiratory tract. Symptoms may include sore throat, coughing and shortness of breath.

Skin contact: Direct skin contact may cause mild to moderate irritation. Prolonged contact, such as when material is trapped against the skin under clothing or jewelry, could result in more significant irritation.

Eye contact: Direct eye contact may cause irritation and possible mechanical damage if not promptly removed.

Ingestion: Harmful if swallowed. May cause irritation to the mouth, throat and stomach. Symptoms may include stomach cramps, nausea, vomiting and diarrhea.

Effects of long-term (chronic) exposure: Repeated ingestion may cause severe weight loss.

Carcinogenicity: See TOXICOLOGICAL INFORMATION (Section 11).

Other important hazards: See TOXICOLOGICAL INFORMATION (Section 11).

Potential environmental effects: This product is harmful to aquatic organisms. See ECOLOGICAL INFORMATION (Section 12).

SECTION 4 — FIRST AID MEASURES

Inhalation: Immediately remove victim to fresh air. If breathing has stopped, begin artificial respiration. Obtain medical attention.

Skin: Immediately remove contaminated clothing and shoes. Flush skin with running water for at least 20 minutes. Obtain medical attention if irritation persists. Thoroughly clean contaminated clothing before re-use.

Eyes: Immediately flush eyes with running water for at least 20 minutes. Obtain medical attention or advice.

Ingestion: If ingested, do not induce vomiting. Have victim rinse mouth with water, and then give one to two glasses of water to drink. Never give anything by mouth if victim is unconscious or convulsing. Obtain medical attention immediately.

Note to physician: Treat symptomatically.

SECTION 5 — FIRE FIGHTING MEASURES

Fire hazards/conditions of flammability: This product is not considered flammable. However, this product may ignite when exposed to extreme heat and direct flame. Closed containers may rupture due to a build up of pressure, when exposed to heat and flame. Fine airborne dusts may ignite or explode.

Flammability classification (OSHA 29 CFR 1910.1200): Non-Flammable Solid.

Flash point (Method): N/Av

Flammable limits (% by volume): N/Av

Explosion data: *Sensitivity to mechanical impact:* Not expected to be sensitive.

Sensitivity to static discharge: Not expected to be sensitive.

Auto-ignition temperature: N/Av

Suitable extinguishing media: Use dry chemical, carbon dioxide, water spray or foam. Do not use water jet, as this may spread the fire.

Special fire-fighting procedures/equipment: Firefighters should wear proper chemically protective equipment and self-contained breathing apparatus operated in positive pressure mode. Move containers from fire area if it can be done without risk. Dike area to prevent water run-off. Water spray may be useful in cooling equipment and containers.

Hazardous combustion products: Carbon oxides, nitrogen oxides, sulfur oxides, calcium oxide and other irritating fumes and smoke.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Personal precautions: Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate chemically protective equipment. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable protective equipment.

Environmental precautions: Ensure spilled product does not enter drains, sewers, waterways, or confined spaces. Dike area to prevent entry into the environment.

Spill response/Cleanup: Eliminate all sources of heat, sparks and flame. Ventilate area of release. Stop leak if you can do so without risk. Use non-sparking tools during the clean-up process. Contain spilled material with inert, non-combustible absorbent material, such as universal binder, Fuller's earth or other absorbent clays. Scoop up and place contaminated absorbent material into suitable containers for later disposal (see Section 13). Spills in water should be contained as much as possible by isolation of the contaminated water. Notify the appropriate authorities.

Prohibited materials: None known.

Special spill response procedures: If a spill/release in excess of EPA reportable quantity is made into the environment in the United States, immediately notify the national response center (phone: 1-800-424-8002).

EPA/CERCLA Reportable quantity: None reported.

SECTION 7 — HANDLING AND STORAGE

Safe handling procedures: This material is a harmful solid. Wear full chemically protective equipment during handling. Use only in well ventilated area. Avoid all contact with eyes, skin and clothing. Do not inhale vapors or dusts. Keep away from all unprotected persons and children. Keep away from heat and flame. Keep away from bases and other incompatibles (refer to section 10). Use caution when opening containers. Keep container tightly closed when not in use. Wash thoroughly after handling.

Storage recommendations: Store in a cool, dry, well ventilated area away from incompatibles. Protect container from physical damage. No smoking in the area. Inspect containers periodically for damage or leaks.

Special packaging materials: Always keep in containers made of the same materials as the supply container.

SECTION 8 — EXPOSURE CONTROLS AND PERSONAL PROTECTION

Permissible exposure levels: See Section 2.

Ventilation and engineering controls: If handled indoors, provide mechanical exhaust ventilation to keep concentrations below specified TLV's and PEL's.

Respiratory protection: Respiratory protection is required if airborne concentrations exceed permissible exposure levels. Wear respirators with particle filters, which are jointly approved by the MSHA and NIOSH. Advice should be sought from respiratory protection specialists.

Protective gloves: Wear impervious chemical gloves. Small tears in the gloves and cross-contamination can easily occur. Change gloves frequently and limit manual work. Advice should be sought from glove suppliers.

Eye protection: Wear safety glasses with side shields or chemical splash goggles to prevent dusts from entering the eyes.

Other protective equipment: Wear chemically resistant coveralls, to prevent skin contact. An eyewash station and safety shower should be made available in the immediate working area. Other protective equipment may be required depending on exposure and on workplace standards.

General hygiene considerations: Do not breathe vapors or dusts. Avoid contact all contact with eyes, skin and clothing. Before removing gloves, wash them with soap and water. Always wash hands, face and arms with soap and water before smoking, eating or drinking. After work, take off all protective equipment, work clothes and shoes, and wash with soap and water. Respirator should be cleaned and filter replaced according to manufacturer's instructions. Wear only clean, uncontaminated clothes when leaving place of work.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Physical state, odor and appearance: Beige, odorless solid.

Odor threshold: N/Av

Boiling point: N/Av

Melting/freezing point: N/Av.

Percent Volatile by Weight: N/Av

Viscosity: N/Av

Vapour pressure: Tribenuron-Methyl Technical: 4.0×10^{-9} mm Hg @ 77°F / 25°C

Coefficient of n-Octanol/water distribution: Tribenuron-Methyl Technical: $\log K_{ow} = 2.3$ at pH 1.5
 $\log K_{ow} = -0.44$ at pH 7.0

Solubility in water: This product may be soluble in water.

Tribenuron-Methyl Technical: 28 mg/l @ 77°F / 25°C and pH 4.0

2040 mg/l @ 68°F / 20°C and pH 7.0

Solubility in organic solvents: Tribenuron-Methyl Technical: 0.028 g/L @ 77°F / 25°C (Hexane)

43.8 g/L @ 77°F / 25°C (Acetone)

3.39 g/L @ 77°F / 25°C (Methanol)

54.2 g/L @ 77°F / 25°C (Acetonitrile)

Specific gravity (water = 1): 0.5117

pH: 6.89

Vapour density (Air=1.0): N/Av

Evaporation rate (n-BuAc=1.0): N/Av

SECTION 10 — REACTIVITY AND STABILITY DATA

Stability and reactivity: Stable under the recommended storage and handling conditions prescribed.

Hazardous polymerization: Will not occur.

Conditions to avoid: Avoid heat, flame and other sources of ignition.

Materials to avoid (incompatibles): Oxidizing agents, acids, fluorine, magnesium.

Hazardous decomposition products: None known. Refer also to 'Hazardous combustion products', Section 5.

SECTION 11 — TOXICOLOGICAL INFORMATION

Routes of exposure: Skin contact, eye contact, inhalation, and ingestion.

Carcinogenicity: None of the ingredients in this product are classified as carcinogenic by IARC, ACGIH, OSHA or NTP.

Teratogenicity, mutagenicity, other reproductive effects: No known teratogenic, mutagenic or reproductive effects.

Sensitization to material: Not expected to be a skin or respiratory sensitizer.

Synergistic materials: Not available.

Conditions aggravated by exposure: Pre-existing skin, eye, digestive or respiratory disorders.

SECTION 11 — TOXICOLOGICAL INFORMATION Continued

Toxicological data: LD₅₀ Oral (rat) = >2000 mg/kg
LD₅₀ Dermal (rat) = >2000 mg/kg
LC₅₀ 4-Hr Inhalation (rat) = >5.18 mg/L

SECTION 12 — ECOLOGICAL INFORMATION

Ecotoxicological information: There is no available data on the product itself. However, the product should not be allowed to enter drains or water courses or be deposited where it can affect ground or surface waters. This product is an herbicide. The active ingredient, Tribenuron-Methyl Technical, is considered to be toxic to many plants, and non-toxic to fish, aquatic invertebrates, soil micro- and macro-organisms, birds, mammals and insects. The acute toxicity of Tribenuron-Methyl Technical is measured to be:

Fish – 96-Hr LC₅₀, Rainbow Trout (*Oncorhynchus mykiss*) = >1000 ppm.

Invertebrates – 96-Hr EC₅₀, Water Flea (*Daphnia magna*) = > 720 ppm.

Bees - 48-Hr LD₅₀, Bees = >100 µg/bee.

Plants – 14-Day EC₅₀, Duckweed (*Lemna minor*) = 9.9 µg/l

72-Hr EC₅₀, Green Algae (*Selenastrum capricornutum*) = 8.0 mg/l

Mobility: The active ingredient, Tribenuron-Methyl Technical, is expected to have high mobility in soil.

Persistence and degradability: The active ingredient, Tribenuron-Methyl Technical is not persistent in the environment.

Degradation half-lives vary with circumstances, from a few days to a few weeks in aerobic water and soil. Its metabolites are considered as persistent.

Bioaccumulative potential: The active ingredient, Tribenuron-Methyl Technical, may be considered to have a low bioconcentration potential. The bioconcentration factor is 3.

SECTION 13 — DISPOSAL CONSIDERATIONS

Handling for disposal: Handle waste according to recommendations in Section 7.

Methods of disposal: Do not contaminate water, foodstuffs, feed or seed by storage or disposal. For disposable containers, triple rinse (or equivalent) containers, and add rinse material to disposal tank. Follow any additional local, state or federal requirements for cleaning containers prior to disposal. Make the empty, rinsed container unsuitable for further use by puncturing. Dispose of in compliance with all Federal, State, Provincial and local regulations.

RCRA: If this product, as supplied, becomes a waste, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.

SECTION 14 — TRANSPORTATION INFORMATION

US 49CFR Shipping Information:

Not regulated for transport by ground within the continental United States.

Canadian Transportation of Dangerous Goods Regulations (TDGR) Shipping Information:

Not regulated for transport by ground within Canada.

SECTION 15 — REGULATORY INFORMATION

Canadian Information:

WHMIS information: This product is a Pest Control Product and is not regulated as a Controlled Product under the Hazardous Products Act (HPA). However, for reference purposes only, this product would have the following WHMIS Classification if it were regulated as a Controlled Product under the HPA: **Class D2B** (*Materials causing other toxic effects, Toxic Material*)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

US Federal Information:

EPA/CERCLA Reportable Quantity (RQ): None reported.

SARA TITLE III:

Sec. 302, Extremely Hazardous Substances, 40 CFR 355: No Extremely Hazardous Substances are present.

Sec. 313, Toxic Chemicals Notification, 40 CFR 372: This material may be subject to SARA notification requirements, since it contains Tribenuron-Methyl Technical, a Toxic Chemical constituent above the *de minimus* concentration.

SECTION 15 — REGULATORY INFORMATION Continued

US State Right to Know Laws:

California Proposition 65 Information: To the best of our knowledge, this product is not known to contain any chemicals known to the State of California to cause cancer and/or reproductive harm.

SECTION 16 — OTHER INFORMATION

HMIS Rating: * - Chronic hazard 0 - Minimal 1 - Slight 2 - Moderate 3 - Serious 4 - Severe
Health: 1 Flammability: 1 Reactivity: 0

Legend: ACGIH – American Conference of Governmental Industrial Hygienists
CAS - Chemical Abstract Service
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR – Code of Federal Regulations
NIOSH – National Institute for Occupational Safety and Health
PMRA – Canadian Pest Management Regulatory Agency
WHMIS – Workplace Hazardous Materials Information System
EPA – Environmental Protection Agency
HMIS - Hazardous Materials Identification System
IARC – International Agency for Research on Cancer
MSHA – Mine Safety and Health Administration
NTP – National Toxicology Program
OSHA – Occupational Safety and Health Act
RCRA – Resource Conservation and Recovery Act
SARA - Superfund Amendments & Reauthorization Act
Inh – Inhalation
N/Ap – Not Applicable
N/Av – Not Available
TSCA – Toxic Substances Control Act
TLV – Threshold Limit Value
PEL - Permissible Exposure Limit

References: 1. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2006.
2. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases, 2007 (Chempendium, HSDB and RTECs).
3. International Agency for Research on Cancer Monographs, searched 2007.
4. US EPA Title III List of Lists – January 27, 2005 version.
5. California Proposition 65 List – June 1, 2007 version.

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