

MATERIAL SAFETY DATA SHEET

SECTION 1 - IDENTIFICATION

Product identifier : **NUANCE HERBICIDE**

Product Code(s) : None reported.

Product Use : Herbicide

Chemical Family : Mixture

Supplier's name and address:
Cheminova, Inc.
 One Park Drive, Suite 150
 PO Box 110566
 Research Triangle Park, NC, USA
 27709

Manufacturer's name and address:
Cheminova A/S
 PO Box 9
 DK-7620
 Lemvig, , Denmark

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

24 Hr. Emergency Tel # : Chemtrec (800) 424-9300 (Within Continental U.S.); Chemtrec (703) 527-3887 (Outside U.S.).
 For Medical Emergencies: (800) 303-6950

SECTION 2 - HAZARDS IDENTIFICATION

Classification : OSHA: This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).
 Hazardous classification: Acute Health Hazard; Chronic Health Hazard

WHMIS information: This product is a Pest Control Product and is not regulated as a Controlled Product under the Hazardous Products Act (HPA).
 For informational purposes, this product would have the following WHMIS classification: Class D2B (Materials Causing Other Toxic Effects, Toxic Material)

Emergency Overview : Beige solid. Odorless.
 Warning! May cause eye and skin irritation. May cause irritation to the mouth, throat and stomach. Causes respiratory tract irritation. May cause long-term adverse effects in the environment. Harmful to plants.

POTENTIAL HEALTH EFFECTS:

Signs and symptoms of short-term (acute) exposure

- Inhalation* : Dusts may cause irritation of the mucous membranes and respiratory tract. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.
- Skin* : May cause mild to moderate skin irritation. Symptoms may include redness, itching and swelling. Prolonged contact, such as when trapped against the skin under clothing or jewelry, may be more irritating.
- Eyes* : May cause mild eye irritation. Inert particles may cause mechanical irritation of the eyes, including scratches.
- Ingestion* : Harmful if swallowed. May cause irritation of mouth, throat, and stomach. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects.

Effects of long-term (chronic) exposure

- : Repeated ingestion may cause severe weight loss.
- Carcinogenic status** : See TOXICOLOGICAL INFORMATION, Section 11.
- Additional health hazards** : See TOXICOLOGICAL INFORMATION, Section 11.

Potential environmental effects

- : Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. See ECOLOGICAL INFORMATION (Section 12).

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS #	Wt.%
Tribenuron Methyl Technical	101200-48-0	60.00 - 100.00
Calcium carbonate	1317-65-3	1.00 - 5.00

Sulfonated aromatic polymer	Proprietary	1.00 - 5.00
Alkyl-naphthalenesulfonate, sodium salt	Proprietary	1.00 - 5.00
Sulfonated lignin	Proprietary	1.00 - 5.00

SECTION 4 - FIRST AID MEASURES

- Inhalation** : Immediately remove person to fresh air. If breathing is difficult, give oxygen by qualified medical personnel only. If breathing has stopped, give artificial respiration. Seek immediate medical attention/advice.
- Skin contact** : Take off all contaminated clothing immediately. Immediately flush skin with gently flowing, running water for at least 20 minutes. If irritation persists, seek prompt medical attention. Wash contaminated clothing before re-use.
- Eye contact** : Flush eyes thoroughly with running water for at least 20 minutes, holding eyelids open to ensure complete flushing. Seek immediate medical attention/advice.
- Ingestion** : Do NOT induce vomiting. Have victim rinse mouth with water, then give one to two glasses of water to drink. Never give anything by mouth to an unconscious person. Seek immediate medical attention/advice.
- Notes For Physician** : Treat symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES

- Fire hazards/conditions of flammability** : Not flammable under normal conditions of use. However, may ignite if exposed to extreme heat and flame. Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure. Fine dust dispersed in air may ignite.
- Flammability classification (OSHA 29 CFR 1910.1200)** : Non-flammable.
- Oxidizing properties** : None known.
- Explosion data: Sensitivity to mechanical impact / static discharge** : Not expected to be sensitive to mechanical impact or static discharge.
- Suitable extinguishing media** : Dry chemical, foam, carbon dioxide and water fog. Do not use water jet, as this may spread burning material.
- Special fire-fighting procedures/equipment** : Firefighters should wear proper protective equipment and self contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if safe to do so. Water spray may be useful in cooling equipment exposed to heat and flame. Avoid spreading burning solid with water spray used for cooling purposes.
- Hazardous combustion products** : Carbon oxides; Sulphur oxides; nitrogen oxides (NOx); calcium oxide; irritating fumes and smoke.
- NFPA Rating** :

0 - Minimal	1 - Slight	2 - Moderate	3 - Serious	4 - Severe
<i>Health:</i> 1	<i>Flammability:</i> 1	<i>Instability:</i> 0	<i>Special Hazards:</i> None	

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 protective equipment including self-contained breathing apparatus. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment.
- Environmental precautions** : Ensure spilled product does not enter drains, sewers, waterways, or confined spaces. If necessary, dike well ahead of the spill to prevent runoff into drains, sewers, or any natural waterway or drinking supply.
- Spill response/cleanup** : Remove all sources of ignition. Ventilate area of release. Stop the spill at source if it is safe to do so. Contain and absorb spilled material with inert, non-combustible absorbent material, such as sand. Sweep up and shovel into suitable containers for disposal. For a water spill, confine the spill immediately with booms. Notify the appropriate authorities as required.
- Prohibited materials** : None known.
- Special spill response procedures** : In case of a transportation accident, in the United States contact CHEMTREC at 1-800-424-9300 or International at 1-703-527-3887. If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8002). US CERCLA Reportable quantity (RQ): None.

SECTION 7 - HANDLING AND STORAGE

- Safe Handling procedures** : This material is a harmful solid. Wear chemically resistant protective equipment during handling. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Do not breathe vapours/dust. Keep away from heat and flame. Avoid contact with incompatible materials. Use caution when opening cap. Keep containers tightly closed when not in use. Wash thoroughly after handling.
- Storage requirements** : Store in a cool, dry, well ventilated area. Keep away from incompatibles. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. No smoking in the area.
- Incompatible materials** : Strong oxidizing agents; Acids; fluorine; magnesium.
- Special packaging materials** : Always keep in containers made of the same materials as the supply container.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

<u>Exposure Limits</u>				
<u>Ingredients</u>	<u>ACGIH TLV</u>		<u>OSHA PEL</u>	
	<u>TWA</u>	<u>STEL</u>	<u>PEL</u>	<u>STEL</u>
Tribenuron Methyl Technical	N/Av	N/Av	N/Av	N/Av
Calcium carbonate	10mg/m ³	N/Av	15 mg/m ³ (total dust); 5 mg/m ³ (respirable fraction)	N/Av
Sulfonated aromatic polymer	N/Av	N/Av	N/Av	N/Av
Alkyl naphthalenesulfonate, sodium salt	N/Av	N/Av	N/Av	N/Av
Sulfonated lignin	N/Av	N/Av	N/Av	N/Av

- Ventilation and engineering measures** : Provide sufficient ventilation to keep vapour concentration below the given TLV and/or PEL.
- Respiratory protection** : Respiratory protection is required if the concentrations exceed the TLV. NIOSH-approved respirators are recommended. Seek advice from respiratory protection specialists.
- Skin protection** : Impervious gloves must be worn when using this product. Small tears in gloves and cross-contamination can easily occur. Change gloves frequently and limit manual work. Advice should be sought from glove suppliers.
- Eye / face protection** : Safety glasses with side-shields or chemical splash goggles.
- Other protective equipment** : Wear resistant clothing and boots. An eyewash station and safety shower should be made available in the immediate working area.
- General hygiene considerations** : Avoid breathing vapors, fumes or dust. Avoid contact with skin, eyes and clothing. Do not eat, drink, smoke or use cosmetics while working with this product. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Remove soiled clothing and wash it thoroughly before reuse. Do not take contaminated clothing home.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

- Physical state** : solid
- Appearance** : Beige solid.
- Odour** : Odorless.
- Odour threshold** : N/Av
- pH** : 6.89
- Boiling point** : N/Av
- Specific gravity** : 0.5117
- Melting/Freezing point** : N/Av
- Coefficient of water/oil distribution** : Tribenuron-methyl Technical: log Kow = 2.3 at pH 1.5; -0.44 at pH 7.0
- Vapour pressure (mmHg @ 20° C / 68° F)** : Tribenuron-methyl Technical: 4.0 x 10⁻⁹ mm Hg @ 25°C
- Solubility in water** : Tribenuron-methyl Technical: 28 mg/L @ 25°C, pH 4.0 2040 mg/L @ 20°C, pH 7.0

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Vapour density (Air = 1)	: N/Av	Evaporation rate (n-Butyl acetate = 1)	: N/Av
Volatile organic Compounds (VOC's)	: N/Av	Volatiles (% by weight)	: None.
Flash point	: N/Av		
Flash point Method	: N/Av	Auto-ignition temperature	: N/Av
Lower flammable limit (% by vol.)	: N/Av	Upper flammable limit (% by vol.)	: N/Av
Flame Projection Length	: N/Av	Flashback observed	: N/Av

Section 10: Stability And Reactivity

Stability and reactivity	: Stable under the recommended storage and handling conditions prescribed.
Hazardous polymerization	: Will not occur.
Conditions to avoid	: Keep this product away from heat, sparks, flame, and other sources of ignition (e.g. pilot lights, electric motors, static electricity).
Materials To Avoid And Incompatibility	: Incompatible materials (see Section 7).
Hazardous decomposition products	: None known, refer to hazardous combustion products in Section 5.

SECTION 11 - TOXICOLOGICAL INFORMATION

Target organs	: Eyes, skin, respiratory system, digestive system.
Routes of exposure	: <i>Inhalation</i> : YES <i>Skin Absorption</i> : NO <i>Skin & Eyes</i> : YES <i>Ingestion</i> : YES
Toxicological data	: LD50 Oral (rat): >2000 mg/kg LD50 Dermal (rat): >2000 mg/kg LC50 Inhalation (rat): >5.18 mg/kg
Carcinogenic status	: No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.
Reproductive effects	: Not expected to have other reproductive effects.
Teratogenicity	: Not expected to be a teratogen.
Mutagenicity	: Not expected to be mutagenic in humans.
Epidemiology	: Not available.
Sensitization to material	: Not expected to be a skin or respiratory sensitizer.
Synergistic materials	: Not available.
Irritancy	: May cause eye and skin irritation. May cause irritation to upper respiratory system.
other important hazards	: None known.
Conditions aggravated by overexposure	: Pre-existing skin, eye and respiratory disorders.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity	: The active ingredient is: Tribenuron-methyl Technical. The toxicity of the active ingredients to wildlife species is measured to be: Fish - 96-hr LC50, Rainbow Trout (<i>Oncorhynchus mykiss</i>) = >1000 ppm Invertebrates - 96-hr EC50, Water Flea (<i>Daphnia magna</i>) = >720 ppm Bees - 48-hr LD50, Bees = >100 µg/bee Plants - 14-day EC50, Duckweed (<i>Lemna minor</i>) = 9.9 µg/l 72-hr EC50, Green Algae (<i>Selenastrum capricornutum</i>) = 8.0 mg/l
Mobility	: Potential for mobility in soil is high.
Persistence	: The active ingredient is not persistent in the environment. Degradation half-lives vary with with circumstances, from a few days to a few weeks in aerobic water and soil. Metabolites are considered as persistent.
Bioaccumulation potential	: The bioconcentration potential is low.
Other Adverse Environmental effects	: This product is an herbicide. The active ingredient is considered to be toxic to many plants, and non-toxic to fish, aquatic invertebrates, soil micro- and macroorganisms, birds, mammals and insects. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters.

SECTION 13 - DISPOSAL CONSIDERATIONS

Handling for Disposal	: Handle waste according to recommendations in Section 7.
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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 unusable for further use by puncturing. Dispose in accordance with all applicable federal, state, provincial and local regulations. Contact your local, state, provincial or federal environmental agency for specific rules.

RCRA : If this product, as supplied, becomes a waste in the United States, 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: TRANSPORT INFORMATION

Regulatory Information	UN Number	Shipping Name	Class	Packing Group	Label
49CFR/DOT	None	Not regulated.	not regulated	none	
49CFR/DOT Additional information	None.				
TDG	None	Not regulated.	not regulated	none	
TDG Additional information	None.				

SECTION 15 - REGULATORY INFORMATION

US Federal Information:

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

CERCLA Reportable Quantity (RQ) (40 CFR 117.302): None.

SARA TITLE III: Sec. 302, Extremely Hazardous Substances, 40 CFR 355: No Extremely Hazardous Substances are present in this material.

SARA TITLE III: Sec. 311 and 312, MSDS Requirements, 40 CFR 370 Hazard Classes: Immediate (Acute) health hazard; Chronic Health Hazard. Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds for the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SARA TITLE III: Sec. 313, Toxic Chemicals Notification, 40 CFR 372: This product may be subject to SARA notification requirements, since it contains Toxic Chemical constituents above their de minimus concentrations. This product contains: Tribenuron-methyl Technical

US State Right to Know Laws:

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

International Information:

WHMIS information: This product is a Pest Control Product and is not regulated as a Controlled Product under the Hazardous Products Act (HPA).

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

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
 CA: California
 CAS: Chemical Abstract Services

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 CFR: Code of Federal Regulations
 DOT: Department of Transportation
 EPA: Environmental Protection Agency
 HMIS: Hazardous Materials Identification System
 HSDB: Hazardous Substances Data Bank
 IARC: International Agency for Research on Cancer
 Inh: Inhalation
 N/Ap: Not Applicable
 N/Av: Not Available
 NFPA: National Fire Protection Association
 NIOSH: National Institute of Occupational Safety and Health
 NTP: National Toxicology Program
 OSHA: Occupational Safety and Health Administration
 PEL: Permissible exposure limit
 RCRA: Resource Conservation and Recovery Act
 RTECS: Registry of Toxic Effects of Chemical Substances
 SARA: Superfund Amendments and Reauthorization Act
 STEL: Short Term Exposure Limit
 TDG: Canadian Transportation of Dangerous Goods Act & Regulations
 TLV: Threshold Limit Values
 TPQ: Threshold Planning Quantity
 TSCA: Toxic Substance Control Act
 TWA: Time Weighted Average
 WHMIS: Workplace Hazardous Materials Identification System

References

- : 1. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2010.
- 2. International Agency for Research on Cancer Monographs, searched 2010.
- 3. Canadian Centre for Occupational Health and Safety, CCHInfoWeb databases, 2010 (Chempendium, HSDB, RTECs).
- 4. Material Safety Data Sheet from manufacturer.
- 5. US EPA Title III List of Lists.
- 6. California Proposition 65 List.

<p><u>Prepared for:</u> Cheminova Inc PO Box 110566 One Park Drive, Suite 150 Research Triangle Park, NC, USA 27709 Please direct all enquiries to Cheminova.</p>	
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