

NOSB NATIONAL LIST FILE CHECKLIST

CROPS

MATERIAL NAME: Sodium Nitrate

CATEGORY: Synthetic

Complete?: _____

NOSB Database Form

References

MSDS (or equivalent)

_____ **Date file mailed out:** 9/23/94, 1/17/95

~~RELEAS~~ _____

_____ **TAP Reviews from:** Arthur Jeffrey
Paul Sachs, Bruce Spencer, James Johnson

_____ **Supplemental Information:**

MISSING INFORMATION: _____

NOSB/NATIONAL LIST COMMENT FORM/BALLOT

Use this page to write down comments and questions regarding the data presented in the file of this National List material. Also record your planned opinion/vote to save time at the meeting on the National List.

Name of Material Sodium Nitrate

Type of Use: Crops; Livestock; Processing

TAP Review by:

1. Walter Jeffery
2. James Johnson
3. Paul Sachs Bruce Spencer

Comments/Questions:

My Opinion/Vote is:

Signature _____ Date _____

USDA/TAP REVIEWER COMMENT FORM

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Attach additional sheets if you wish.

This file is due back to us within 30 days of: Sept 22

Name of Material: Sodium Nitrate

Reviewer Name: WALTER JEFFERY

Is this substance Natural or Synthetic? Explain (if appropriate)

NATURAL - IT IS A MINED MATERIAL IF IT IS "CHILEAN NITRATE". SOME SMALL AMOUNT OF SYNTHETIC PRODUCT MAY STILL BE PRODUCED AS BY PRODUCT

Please comment on the accuracy of the information in the file:

PRETTY GOOD. PRODUCT IS GENERALLY NOT USED AS A PRIMARY SOURCE OF NITROGEN. NOT A MAJOR FERTILIZER - Not a particularly good nitrogen source & the sodium is harmful.

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, This material does not belong on the National List because:

Are there any restrictions or limitations that should be placed on this material by use or application on the National List?

Any additional comments or references?

Reference: Fertilizer Manual, International Fertilizer Development Center, U.N. Industrial Development Organization, 1978

Signature

Walter Jeffery

Date

10/12/94

USDA/TAP REVIEWER COMMENT FORM

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Attach additional sheets if you wish.

This file is due back to us within 30 days of: due: 3/20/95

Name of Material: Sodium Nitrate

Reviewer Name: J. Johnson

Is this substance Natural or Synthetic? Explain (if appropriate)

~~Synthetic~~ Natural

Please comment on the accuracy of the information in the file:

Need information on "Family", "Action" and "manufacture"

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, This material does not belong on the National List because:

Are there any restrictions or limitations that should be placed on this material by use or application on the National List?

Not to be used as primary N source on soils

Any additional comments or references?

Transplant nurseries using NaNO_3 as primary N source should monitor amount of NO_3^- concentration in soil or choose to recycle the solution by reuse or adding to waste materials for composting.

Signature James R. Johnson Date 3/8/95

ORGANIC FOOD PRODUCTION ACT/NATIONAL LIST SECTIONS

USDA/TAP REVIEWER COMMENT FORM

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Attach additional sheets if you wish.

This file is due back to us within 30 days of: SEPT 22

Name of Material: Sodium Nitrate

Reviewer Name: Bruce Spencer

Is this substance Natural or Synthetic? Explain (if appropriate)

Please comment on the accuracy of the information in the file:

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, This material does not belong on the National List because: Detrimental to soil Biological life. High potential for Abuse if listed as ~~prohibited~~ restricted use.

Are there any restrictions or limitations that should be placed on this material by use or application on the National List?

Any additional comments or references?

Signature Bruce Spencer

Date 10-11-94

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USDA/TAP REVIEWER COMMENT FORM

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Attach additional sheets if you wish.

This file is due back to us within 30 days of: due: MAR 01 1995

Name of Material: Sodium Nitrate

Reviewer Name: Paul Sachs

Is this substance Natural or Synthetic? Explain (if appropriate)

Most sodium nitrate fertilizer is mined from the Atacama Desert in Northern Chile. The ore is ground and the pure sodium nitrate salts are dissolved out. Then the material is sprayed dried. (over-->)#1)

Please comment on the accuracy of the information in the file:

*I seriously question the statement "Avoid shock, friction or heat" made under **Safety guidelines**. The statement implies that if one were to drop or rub a bag of Chilean Nitrate, it would explode. This is simply not the case.*

This material should be added to the National List as:

Synthetic Allowed

Prohibited Natural

or, This material does not belong on the National List

because: *This is a valuable product to farmers involved in organic food production. However, its use as the sole source of nitrogen for any crop should be prohibited. Current restrictions from certification committees that allow its use are that no more (over-->)#2)*

Are there any restrictions or limitations that should be placed on this material by use or application on the National List?

No more than 30 pounds of actual nitrogen from sodium nitrate may be used per acre per year.

Any additional comments or references?

Buchanan, M. and Gliessman, S.R. 1991, How Compost fertilization affects soil nitrogen and crop yield. Biocycle, Dec. 1991. J.G. Press. Emmaus, PA

Signature

Paul O. Sachs

Date

2/1/95

ORGANIC FOOD PRODUCTION ACT/NATIONAL LIST SECTIONS

#1. There are no chemical reactions aside from its dissolution in water. Therefore, by most definitions the material should be considered natural.

#2. than 30 pounds of actual Nitrogen from sodium nitrate can be used per acre per year. The need for some soluble nitrogen in regions where cold soil inhibits the release of organic nitrogen is valid. Studies show that some soluble nitrogen in an organic fertility program can be more efficient and less polluting (Buchanan et al, 1991).

NOSB Materials Database

Identification

Common Name **Sodium Nitrate** **Chemical Name** NaNO₃
Other Names Chilean Nitrate, Soda Niter
Code #: CAS 07631-99-4 **Code #: Other**
N. L. Category Prohibited Natural

Chemistry

Composition NaNO₃ **Family**
Properties Highly Soluble sodium salt. Colorless crystals or white powder with no odor. Specific gravity 2.26, melting point 306 C. Strong oxidizer. Solubility in water 874 g/l @ 20C, pH8.5
How Made Mined from Atacama Desert in Northern Chile. The ore is ground and the pure sodium nitrate salts are dissolved out.

Use/Action

Type of Use Crops
Use(s) fertilizer where high solubility is desired or on soils where temperatures are too low for efficient bacterial nitrogen transformation from organic material. Also where chloride free material is required such as on tobacco, or as surface dressing for cotton and some vegetables.

Action

Combinations

Status

OFPA Natural
N. L. Restriction Prohibited unless used only as a supplement to a balanced fertility program. Prohibited as primary source of nitrogen.
EPA, FDA, etc
Registration
Directions
Safety Guidelines Avoid shock, friction or heat. Unusual fire and explosion hazard. Strong oxidizer.
State Differences
Historical status controversial. Some programs have allowed, some prohibited.
International status prohibited by IFOAM, Mexico, Sweden and Italy.

NOSB Materials Database

OFPA Criteria

- 2119(m)1:chem. inter.** Incompatibly with cyanides, combustible materials, strong reducing agents, aluminum, sulfites such as NaHSO₃, K₂S₂O₅, etc.. Contact with other material may cause fire. May produce nitrogen oxide gases.
- 2119(m)2: toxicity** [May contribute to nitrate contamination in groundwater. Potential build up of salts in soils. At nearly 30% sodium, uptake of nitrate by plants may be inhibited thus leading to ground water contamination.] (JJ).
- 2119(m)3:manufacture** Presumably, some environmental damage may result during the manufacturing process as a result of mining natural areas and processing. However, no direct evidence was found to substantiate this presumption.
- 2119(m)4:humans** Contact with skin or eyes may cause irritation. No carcinogenicity. Inhalation and ingestion may cause cyanosis. The main hazard is from the strongly reactive nature of the substance. [Ingestion of large amounts may cause headaches, nausea, vomiting and abdominal distress. LD50 (Rat) 200 mg/kg. Human deadly dose: 15 grams. Possible reduction of nitrate to nitrite in intestinal tract. Can lead to methemoglobin formation especially in infants.] (JJ).
- 2119(m)5: biology** Contributes a substantial quantity of salt to the soil environment.
- 2119(m)6:alternatives** Compost, manures, cover cropping, blood meal, feather meal.
- 2119(m)7:compatible**

References

- Van Waters & Rogers, Inc. 206/ 889-3400 (JJ)
- Rendig, V.V. and Howard Taylor. 1989. Principles of Soil-Plant Interrelationships. McGraw-Hill, 1-800-2-MCGRAW. (JJ).
- Buchanan, M. and Gliessman, S.R. 1991. How compost fertilization affects soil nitrogen and crop yield. Biocycle, Dec. 1991. J.G. Press. Emmaus. PA.

From: Walter Jeffery

is an appreciable vapor pressure of $NH_3 + HNO_3$ resulting from dissociation of AN, according to the equation:



The dissociation products recombine in the cooler air to form a blue haze consisting of AN particles of submicron size. Particles of this size are difficult to collect, and they present a highly visible and stable haze or fog. The problem is much less serious with low-density prilling because of lower AN solution temperatures. It is less serious in granulation processes because of much smaller volumes of air in contact with hot solution.

The amount of AN in exhaust gas from the high-density prill tower is likely to be only about 0.1% of total production including both dust and fume. Recovery of this amount is seldom justifiable by economics alone but is often necessary for environmental reasons. A solution to this difficult problem has been developed by the Co-Operative Farm Chemicals Association (CFCA) and is in use at its plants in Lawrence, Kansas, and at least 14 other plants in North America (36). The fume abatement system consists of installing a bell-shaped shroud around the spray head in the upper part of the prill tower to collect fume-laden air from that part of the tower where fume is formed due to contact of the air with hot AN solution or prills in the process of solidification. The air flow through this shroud is only about 25% of the total air flow through the tower; the remaining 75% is practically free of dust and fume and is discharged directly to the atmosphere. The air from the shroud is drawn through a scrubber and Brink high-efficiency mist eliminators. Fume and vapors from the neutralizer and evaporators are treated in the same scrubbing system. The scrubber solution is recirculated to build up its concentration and eventually recycled to the AN solution preparation step. The entire system is reported to cost about \$0.5-\$1.5 million for plants of 250-1,000 short tons/day capacity. The system recovers 3-7 kg of AN/ton of product from all sources (neutralizer, evaporator, and prill tower) which more than offsets the operating cost (excluding capital costs). From a pollution abatement viewpoint the system has met applicable standards; atmospheric emissions less than 0.5 kg/ton of product and opacity of less than 10% have been attained (36).

Sodium Nitrate

General Information

Before the availability of synthetic ammonia and its derivatives, sodium nitrate of natural origin was the major source of nitric acid and chemical nitrogen for fertilizer purposes in many countries. Most of this nitrate originated in Chile, where it is principally found in a large ore body nearly 500 miles long and 10-50 miles wide, on the eastern part of the Chilean coastal range. Nitrate production is still a major industry in Chile and currently (1976) is about 650,000 tons of sodium nitrate annually. Small deposits occur in other areas, e.g., Africa, Australia, Mexico, and Egypt. Substantial amounts of synthetic sodium nitrate were formerly made in Europe and the United States, but production has declined since World War II and now only insignificant amounts are produced from byproduct sources.

Principal Uses

As a fertilizer, sodium nitrate has long been applied as a surface dressing for cotton, tobacco, and some vegetable crops. However, its use as a straight nitrogen fertilizer has declined considerably

during the last century. For example, in the United Kingdom, some 20,000 tons of N was used in the form of sodium nitrate in 1899; whereas, relatively none is used today. In the United States, current (1977) consumption is about 10,000 tons of N. As with other nitrates, sodium nitrate is prone to leaching in the soil, but it has the advantage of possessing a metallic cation. Unlike ammonia and its derivatives, including urea, sodium nitrate will not promote cation losses in the soil and lead to unsuspected soil acidity.

Industrial applications include meat preservation, heat treatment of metals, and use as a flux in the ceramic and metallurgical industries.

Properties of Sodium Nitrate

The properties of sodium nitrate are given in table 6.

TABLE 6. PROPERTIES OF PURE SODIUM NITRATE

Formula	NaNO ₃
Guaranteed analysis (typical)	
Nitrogen	16.48%
Sodium	27.05%
Appearance	White crystalline rhombohedra
Molecular weight	85.01
Melting point	308.3°C
Density, 20°/4°C	2.257
Solubility, g/100 g of water	
Temperature (°C)	
0	73
10	96
30	176
100	180
Bulk density	
Pellets	1,202 kg/m ³
Coarse material	1,282 kg/m ³
Fine powder	1,363 kg/m ³
Critical relative humidities	
20°C (68°F)	74.7
30°C (86°F)	73.7

Production Methods

From Natural Deposits--In Chile, the nitrate ore or caliche is widely varying in composition and may range from 80% to virtually zero nitrate content although little high-grade material is available today. A typical analysis of run-of-mine ore might be the following (in percentages):

NaNO ₃	7-10
NaCl	4-10
Na ₂ SO ₄	10-30
Mg, Ca, K, Br, I ₂	2-7
H ₂ O	1-2
Remainder (Gangue)	41-76

These components are present in the form of complex, mixed sulfates, e.g., darapskite (NaNO₃·Na₂SO₄·H₂O).

Early production methods were based on hand-picking the higher grade ore containing about 13% sodium nitrate and leaching it in directly heated open pans until saturation was reached. The solution was then piped to settling pans and cooled to produce sodium nitrate crystals, which were drained, dried in the sun, and bagged or shipped in bulk overseas. An improved version of this method known as the

Shanks process, which was first used about 1890 and remained popular for about 50 years, is now virtually obsolete. Most current production is undertaken by the Guggenheim process, which permits ores containing under 10% nitrate to be profitably worked, thus extending the life of the Chilean nitrate industry by several decades.

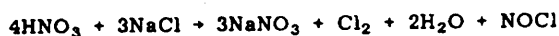
In the Guggenheim method, caliche is mined by open-pit operations, using draglines and power shovels, and is crushed to about 80% between 3/4 and 3/8 in (1.9-0.95 cm). This product is leached at about 40°C with water in a series of vats, each having a capacity of some 10,000 tons of crushed ore. The underflow from each vat is heated before passing to the next since sodium nitrate has a negative heat of solution. After extraction and washing are complete, the residue is removed from the vats by grabs and is hauled to a waste dump.

Fine material from the crushers is pulped in a separate system, and the gangue is removed by means of Moore filters. The filtrates are combined with liquor from the leach tanks and are chilled in shell-and-tube units to precipitate crystalline sodium nitrate. Initial cooling is effected by heat-exchange with in-process leach liquor and final chilling by ammonia. The sodium nitrate slurry is dewatered and washed in batch centrifuges to yield a crystalline product substantially 48-mesh in size and containing approximately 3.5% of free moisture. When a grained or prill-type product is required, the centrifuged salt is melted at about 400°C in reverberatory furnaces, spray dried in large towers, cooled by heat exchange with mother liquor in shell-and-tube units and screened to yield pellets in the 10- to 20-mesh range containing about 98% sodium nitrate and 0.2%-0.3% free moisture.

Iodine salts which are present in the caliche accumulate in the recycling mother liquor and are reduced to iodine in a separate process; this production amounts to some 2,000 tons annually. In addition, it has been found that salts which are insoluble in recycling leach solutions can be extracted from the caliche by fresh water and recovered by solar evaporation and selective crystallization to yield substantial tonnages of additional sodium nitrate, as well as potassium nitrate, various iodates, borates, and sulfates. These associated salts may be of future significance to the Chilean nitrate industry.

Synthetic Sodium Nitrate--The dependence of the United States and other countries on natural Chilean sodium nitrate during the early part of the 20th century led to the development of several chemical processes for its manufacture. All these methods produce a sodium nitrate solution which is concentrated, crystallized, and centrifuged. In some cases, the dewatered and washed salt is dried in a rotary drier prior to screening, storage, and bagging; alternatively, it may be melted and grained or prilled.

Appreciable quantities of sodium nitrate have also been made in the United States by the salt process developed by the Allied Chemical Corporation. In this method (which is believed not to be currently in operation), nitric acid and sodium chloride are reacted to yield sodium nitrate, chlorine, nitrosyl chloride and water, e.g.:

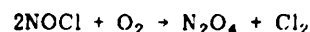


The nitrosyl chloride can be used as an intermediate for other derivatives, or it can be reacted with sodium carbonate to yield additional sodium nitrate, sodium chloride, nitric oxide, and carbon dioxide:



The salts produced can be redigested and the nitric oxide used to make additional sodium nitrate (or

nitric acid). Alternatively, the nitrosyl chloride can be oxidized to yield dinitrogen tetroxide and chlorine for further use, e.g.:



Other methods used to produce sodium nitrate in minor quantities (sometimes as a byproduct) include reacting nitric acid with soda ash or caustic soda and using ion-exchange between calcium nitrate and a sodium zeolite. Several double-decomposition reactions between various nitrates and alkali salts, for example, ammonium nitrate and caustic soda or common salt, have either been proposed or tested on a small scale.

Storage

Sodium nitrate can be stored and shipped in bulk under conditions of low humidity but should be packed in moisture-resistant bags when intended for use in damp or tropical climates. In some countries, it is regarded as a potential fire hazard and may necessitate special labeling, insurance, and other precautions as for ammonium nitrate and potassium nitrate. Such materials as bags or timber, subsequently allowed to dry after impregnation with sodium nitrate, may quickly ignite if exposed to elevated temperatures and should be destroyed or thoroughly washed and fireproofed.

Potassium Nitrate

The production, properties, and use of potassium nitrate will be covered in chapter XVIII (Potash Fertilizers).

Calcium Nitrate

General Information

Although simple methods are available for producing calcium nitrate, its use as a fertilizer is offset by extreme hygroscopicity even in moderately humid climates. It is possible that the more recent availability of impervious plastic bags may increase the popularity of calcium nitrate for agricultural use. As a fertilizer, calcium nitrate has special advantages for use on saline soils since the calcium displaces the sodium that is absorbed by clay in soils. For this reason it may be preferred for use in areas with soil salinity problems, such as parts of Egypt and California. It also has the advantage of being nonacid-forming. Other applications include explosives, pyrotechnics, and inorganic chemical operations.

Properties of Calcium Nitrate

The properties of calcium nitrate are given in table 7.

Production Methods

Most calcium nitrate comes from Europe, where it is produced in two principal ways. In one method a direct reaction between calcium carbonate and nitric acid is employed, and in the other the calcium nitrate formed as a coproduct in some nitrophosphate processes is separated by crystallization and filtration or centrifuging.

Direct Process--In the direct process, crushed limestone is reacted with 50% nitric acid in towers lined with acid-resistant brick, and the residual acid is neutralized with lime. The liquor which contains

MSDS for SODIUM NITRATE, CRYSTAL

1 - PRODUCT IDENTIFICATION

PRODUCT NAME: SODIUM NITRATE, CRYSTAL
FORMULA: NANO3 FORMULA WT: 84.99
CAS NO.: 07631-99-4 NIOSH/RTECS NO.: WC5600000
COMMON SYNONYMS: SODIUM(I)NITRATE; NITRIC ACID, SODIUM SALT; SODA NITER;
CHILE SALTPETER
PRODUCT CODES: 3771,3770,4501
EFFECTIVE: 01/22/87 REVISION #02

PRECAUTIONARY LABELLING BAKER SAF-T-DATA(TM) SYSTEM

HEALTH - 1 SLIGHT
FLAMMABILITY - 0 NONE
REACTIVITY - 3 SEVERE (OXIDIZER)
CONTACT - 1 SLIGHT

HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT
SAFETY GLASSES; LAB COAT

PRECAUTIONARY LABEL STATEMENTS

DANGER
CAUSES IRRITATION
HARMFUL IF SWALLOWED OR INHALED
STRONG OXIDIZER - CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE
KEEP FROM CONTACT WITH CLOTHING AND OTHER COMBUSTIBLE MATERIALS. DO NOT
STORE NEAR COMBUSTIBLE MATERIALS. AVOID CONTACT WITH EYES, SKIN, CLOTHING.
KEEP IN TIGHTLY CLOSED CONTAINER. WASH THOROUGHLY AFTER HANDLING. IN CASE
OF FIRE, SOAK WITH WATER. IN CASE OF SPILL, SWEEP UP AND REMOVE. FLUSH SPILL
AREA WITH WATER.

SAF-T-DATA(TM) STORAGE COLOR CODE: YELLOW (REACTIVE)

2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.
SODIUM NITRATE	90-100	7631-99-4

3 - PHYSICAL DATA

BOILING POINT: N/A	VAPOR PRESSURE(MM HG): N/A
MELTING POINT: 306 C (583 F)	VAPOR DENSITY(AIR=1): 2.90
SPECIFIC GRAVITY: 2.26 (H2O=1)	EVAPORATION RATE: N/A (BUTYL ACETATE=1)

SOLUBILITY(H₂O): APPRECIABLE (MORE THAN 10 %) % VOLATILES BY VOLUME: 0

APPEARANCE & ODOR: COLORLESS CRYSTALS OR WHITE POWDER WITH NO ODOR.

4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP N/A NFPA 704M RATING: 0-0-0 OXY

FLAMMABLE LIMITS: UPPER - N/A % LOWER - N/A %

FIRE EXTINGUISHING MEDIA
USE WATER SPRAY.

SPECIAL FIRE-FIGHTING PROCEDURES

FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS

STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. CAN REACT VIOLENTLY WITH SHOCK, FRICTION OR HEAT.

TOXIC GASES PRODUCED
NITROGEN OXIDES

5 - HEALTH HAZARD DATA

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE

INHALATION OF DUST MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT.
CONTACT WITH SKIN OR EYES MAY CAUSE IRRITATION.
PROLONGED EXPOSURE MAY CAUSE DERMATITIS.
INGESTION MAY CAUSE GASTROINTESTINAL IRRITATION.
INHALATION AND INGESTION MAY CAUSE CYANOSIS. THE EFFECTS OF EXPOSURE MAY INCLUDE HEADACHE, NAUSEA, VOMITING, DIZZINESS, WEAKNESS, RAPID INEFFECTIVE BREATHING, LOW BLOOD PRESSURE, LOSS OF CONSCIOUSNESS, OR CONVULSIONS.

TARGET ORGANS: NONE IDENTIFIED

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE IDENTIFIED

ROUTES OF ENTRY: INHALATION, INGESTION, SKIN CONTACT, EYE CONTACT

EMERGENCY AND FIRST AID PROCEDURES
CALL A PHYSICIAN.

IF SWALLOWED, IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION.
IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST
15 MINUTES. FLUSH SKIN WITH WATER.

6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: SHOCK, FRICTION, HEAT

INCOMPATIBLES: CYANIDES, COMBUSTIBLE MATERIALS, STRONG REDUCING AGENTS,
ALUMINUM

DECOMPOSITION PRODUCTS: OXIDES OF NITROGEN

7 - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SUITABLE PROTECTIVE CLOTHING. KEEP COMBUSTIBLES (WOOD, PAPER, OIL,
ETC.) AWAY FROM SPILLED MATERIAL. WITH CLEAN SHOVEL, CAREFULLY PLACE
MATERIAL INTO CLEAN, DRY CONTAINER AND COVER; REMOVE FROM AREA. FLUSH
SPILL AREA WITH WATER.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL
ENVIRONMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: D001 (IGNITABLE WASTE)

8 - PROTECTIVE EQUIPMENT

VENTILATION: USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION
TO KEEP FUME OR DUST LEVELS AS LOW AS POSSIBLE.

RESPIRATORY PROTECTION: NONE REQUIRED WHERE ADEQUATE VENTILATION
CONDITIONS EXIST. IF AIRBORNE CONCENTRATION IS
HIGH, USE AN APPROPRIATE RESPIRATOR OR DUST MASK.

EYE/SKIN PROTECTION: SAFETY GLASSES WITH SIDESHIELDS, BUTYL RUBBER
GLOVES ARE RECOMMENDED.

9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: YELLOW (REACTIVE)

SPECIAL PRECAUTIONS

KEEP CONTAINER TIGHTLY CLOSED. STORE SEPARATELY AND AWAY FROM FLAMMABLE AND COMBUSTIBLE MATERIALS.

10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME SODIUM NITRATE
HAZARD CLASS OXIDIZER
UN/NA UN1498
LABELS OXIDIZER

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME SODIUM NITRATE
HAZARD CLASS 5.1
UN/NA UN1498
LABELS OXIDIZING AGENT