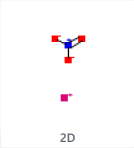
PubChem

COMPOUND SUMMARY

Potassium nitrate

PubChem CID	24434
Structure	 2D Find Similar Structures
Chemical Safety	 Oxidizer Irritant Laboratory Chemical Safety Summary (LCSS) Datasheet
Molecular Formula	KNO_3
Synonyms	POTASSIUM NITRATE 7757-79-1 Nitre Nitrate of potash Nitric acid potassium salt More...
Molecular Weight	101.103
Component Compounds	 CID 944 (Nitric acid) CID 5462222 (Potassium)
Dates	Modify 2021-05-22 Create 2005-06-24

Potassium Nitrate is a crystalline salt, KNO3; a strong oxidizer used especially in making gunpowder, as a fertilizer, and in medicine.

▸ NCI Thesaurus (NCIt)

Potassium nitrate appears as a white to dirty gray crystalline solid. Water soluble. Noncombustible, but accelerates the burning of combustible materials. If large quantities are involved in fire or the combustible material is finely divided an explosion may result. May explode under prolonged exposure to heat or fire. Toxic oxides of nitrogen are produced in fires. Used in solid propellants, explosives, fertilizers.

▸ CAMEO Chemicals

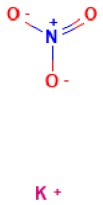
Potassium nitrate is the inorganic nitrate salt of potassium. It has a role as a fertilizer. It is a potassium salt and an inorganic nitrate salt.

▸ ChEBI

1 Structures

1.1 2D Structure

Chemical Structure Depiction



PubChem

1.2 3D Status

Conformer generation is disallowed since MMFF94s unsupported element, mixture or salt

PubChem

2 Names and Identifiers

2.1 Computed Descriptors

2.1.1 IUPAC Name

potassium;nitrate

Computed by LexiChem 2.6.6 (PubChem release 2019.06.18)

PubChem

2.1.2 InChI

InChI=1S/K.NO3/c;2-1(3)4/q+1;-1

Computed by InChI 1.0.5 (PubChem release 2019.06.18)

PubChem

2.1.3 InChI Key

FGIUAXJPYTZDNR-UHFFFAOYSA-N

Computed by InChI 1.0.5 (PubChem release 2019.06.18)

PubChem

2.1.4 Canonical SMILES

[N+](=O)([O-])[O-].[K+]

Computed by OEChem 2.1.5 (PubChem release 2019.06.18)

PubChem

2.2 Molecular Formula

KNO3

CAMEO Chemicals; EU Food Improvement Agents; ILO International Chemical Safety Cards (ICSC); Wikipedia; PubChem

2.3 Other Identifiers

2.3.1 CAS

7757-79-1

CAMEO Chemicals; ChemIDplus; DrugBank; EPA Chemicals under the TSCA; EPA DSSTox; European Chemicals Agency (ECHA); Hazardous Substances Data Bank (HSDB); ILO International Chemical Safety Cards (ICSC); The Na

2.3.2 Deprecated CAS

96193-83-8

ChemIDplus

2.3.3 European Community (EC) Number

231-818-8

EU Food Improvement Agents; European Chemicals Agency (ECHA)

2.3.4 ICSC Number

0184

ILO International Chemical Safety Cards (ICSC)

2.3.5 RTECS Number

TT3700000

The National Institute for Occupational Safety and Health (NIOSH)

2.3.6 UN Number

1486

CAMEO Chemicals; DOT Emergency Response Guidebook; ILO International Chemical Safety Cards (ICSC); NJDOH RTK Hazardous Substance List

2.3.7 UNII

RU45X2JN0Z

FDA/SPL Indexing Data

2.3.8 DSSTox Substance ID

DTXSID4029692

EPA DSSTox

2.3.9 Wikipedia

Potassium nitrate

Wikipedia

2.4 Synonyms

2.4.1 MeSH Entry Terms

potassium nitrate
potassium nitrate monohydrate
saltpeter
saltpetre

Medical Subject Headings (MeSH)

2.4.2 Depositor-Supplied Synonyms

POTASSIUM NITRATE	Vicknite	Potassium nitrate(DOT)	UN1486	INS NO.252	DB11090
7757-79-1	CHEBI:63043	Potassium nitrate, 99%, extra pure	EPA Pesticide Chemical Code 076103	DTXSID4029692	Potassium nitrate, BioXtr
Nitre	saltpetre	potassium;nitrate	Potassium nitrate [USP:JAN]	Potassium nitrate, p.a., 99%	NCGC00249235-01
Nitrate of potash	Kalii nitras	Potassium nitrate, 99+%, ACS reagent	AI3-51245	INS-252	NCGC00257274-01
Nitric acid potassium salt	DSSTox_CID_9692	Potassium nitrate, 99+%, for analysis	Potassium-nitrate	Potassium nitrate, Puratronic(R)	NCGC00259130-01
Nitric acid, potassium salt	DSSTox_RID_78811	CAS-7757-79-1	Sensodyne (TN)	Tox21_201581	BP-31027
Kaliumnitrat	DSSTox_GSID_29692	Potassium nitrate, 99+%, for biochemistry	Potassium Nitrate,(S)	Tox21_303394	E252
UNII-RU45X2JN0Z	Potassium nitrate, 99%, pure	CCRIS 3667	ACMC-1BIXH	Potassium nitrate, AR, >=99.5%	Potassium nitrate [UN14
MFCD00011409	Salt peter (VAN)	HSDB 1227	Potassium nitrate, 99%	Potassium nitrate, LR, >=99.5%	Potassium nitrate, ACS re
Nitric acid potassium salt (1:1)	CHEMBL1644029	Potassium nitrate, 99.999%, (trace metal basis)	EC 231-818-8	AKOS015902862	Potassium nitrate, NIST(I
KNO3	Caswell No. 697	EINECS 231-818-8	Potassium Nitrate ACS grade	AKOS024418772	E-252
RU45X2JN0Z	Kaliumnitrat [German]	NSC 57632	Potassium nitrate (JAN/USP)	Potassium nitrate, cell culture tested	FT-0698960

PubChem

3 Chemical and Physical Properties

3.1 Computed Properties

Property Name	Property Value	Reference
Molecular Weight	101.103	Computed by PubChem 2.1 (PubChem release 2021.05.07)
Hydrogen Bond Donor Count	0	Computed by Cactvs 3.4.6.11 (PubChem release 2019.06.18)
Hydrogen Bond Acceptor Count	3	Computed by Cactvs 3.4.6.11 (PubChem release 2019.06.18)
Rotatable Bond Count	0	Computed by Cactvs 3.4.6.11 (PubChem release 2019.06.18)
Exact Mass	100.95152435	Computed by PubChem 2.1 (PubChem release 2021.05.07)
Monoisotopic Mass	100.95152435	Computed by PubChem 2.1 (PubChem release 2021.05.07)
Topological Polar Surface Area	62.9 Å²	Computed by Cactvs 3.4.6.11 (PubChem release 2019.06.18)
Heavy Atom Count	5	Computed by PubChem
Formal Charge	0	Computed by PubChem
Complexity	18.8	Computed by Cactvs 3.4.6.11 (PubChem release 2019.06.18)
Isotope Atom Count	0	Computed by PubChem
Defined Atom Stereocenter Count	0	Computed by PubChem
Undefined Atom Stereocenter Count	0	Computed by PubChem
Defined Bond Stereocenter Count	0	Computed by PubChem
Undefined Bond Stereocenter Count	0	Computed by PubChem
Covalently-Bonded Unit Count	2	Computed by PubChem
Compound Is Canonicalized	Yes	Computed by PubChem (release 2019.01.04)

PubChem

3.2 Experimental Properties

3.2.1 Physical Description

Potassium nitrate appears as a white to dirty gray crystalline solid. Water soluble. Noncombustible, but accelerates the burning of combustible materials. If large quantities are involved in fire or the combustible material is finely divided an explosion may result. May explode under prolonged exposure to heat or fire. Toxic oxides of nitrogen are produced in fires. Used in solid propellants, explosives, fertilizers.

CAMEO Chemicals

DryPowder; DryPowder, PelletsLargeCrystals; Liquid; OtherSolid; PelletsLargeCrystals

EPA Chemicals under the TSCA

White crystalline powder or transparent prisms having a cooling, saline, pungent taste

EU Food Improvement Agents

COLOURLESS-TO-WHITE CRYSTALLINE POWDER.

ILO International Chemical Safety Cards (ICSC)

3.2.2 Color/Form

Colorless, rhombic or trigonal crystals

Lide, D.R. CRC Handbook of Chemistry and Physics 86TH Edition 2005-2006. CRC Press, Taylor & Francis, Boca Raton, FL 2005, p. 4-80

Hazardous Substances Data Bank (HSDB)

White granular or crystalline powder

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 13th Edition, Whitehouse Station, NJ: Merck and Co., Inc., 2001., p. 1370

Hazardous Substances Data Bank (HSDB)

3.2.3 Odor

Odorless

Lewis, R.J. Sax's Dangerous Properties of Industrial Materials. 10th ed. Volumes 1-3 New York, NY: John Wiley & Sons Inc., 1999., p. 3035

Hazardous Substances Data Bank (HSDB)

3.2.4 Taste

Cooling, saline pungent taste

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 13th Edition, Whitehouse Station, NJ: Merck and Co., Inc., 2001., p. 1370

Hazardous Substances Data Bank (HSDB)

3.2.5 Boiling Point

752 °F at 760 mm Hg (decomposes) (USCG, 1999)

U.S. Coast Guard. 1999. Chemical Hazard Response Information System (CHRIS) - Hazardous Chemical Data. Commandant Instruction 16465.12C. Washington, D.C.: U.S. Government Printing Office.

▸ **CAMEO Chemicals**

400

MSDS

▸ **DrugBank**

400 °C (decomp)

Lide, D.R. CRC Handbook of Chemistry and Physics 86TH Edition 2005-2006. CRC Press, Taylor & Francis, Boca Raton, FL 2005, p. 4-80

▸ **Hazardous Substances Data Bank (HSDB)**

3.2.6 Melting Point

633.2 °F (USCG, 1999)

U.S. Coast Guard. 1999. Chemical Hazard Response Information System (CHRIS) - Hazardous Chemical Data. Commandant Instruction 16465.12C. Washington, D.C.: U.S. Government Printing Office.

▸ **CAMEO Chemicals**

334

MSDS

▸ **DrugBank**

337 °C

Lide, D.R. CRC Handbook of Chemistry and Physics 86TH Edition 2005-2006. CRC Press, Taylor & Francis, Boca Raton, FL 2005, p. 4-80

▸ **Hazardous Substances Data Bank (HSDB)**

333-334 °C

▸ **ILO International Chemical Safety Cards (ICSC)**

3.2.7 Solubility

35g/100ml

https://www.cdc.gov/niosh/ipcsneng/neng0184.html

▸ **DrugBank**

Sol in water, glycerol; slightly sol in alcohol

Lewis, R.J. Sr.; Hawley's Condensed Chemical Dictionary 14th Edition. John Wiley & Sons, Inc. New York, NY 2001., p. 915

▸ **Hazardous Substances Data Bank (HSDB)**

Insoluble in ethanol

Lide, D.R. CRC Handbook of Chemistry and Physics 86TH Edition 2005-2006. CRC Press, Taylor & Francis, Boca Raton, FL 2005, p. 4-80

▸ **Hazardous Substances Data Bank (HSDB)**

1 g/2.8 mL water at about 25 °C; 1 g/0.5 mL boiling water; 1 g/620 mL alcohol

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 13th Edition, Whitehouse Station, NJ: Merck and Co., Inc., 2001., p. 1370

▸ **Hazardous Substances Data Bank (HSDB)**

38.3 g/100 g water at 25 °C

Lide, D.R. CRC Handbook of Chemistry and Physics 86TH Edition 2005-2006. CRC Press, Taylor & Francis, Boca Raton, FL 2005, p. 4-80

▸ **Hazardous Substances Data Bank (HSDB)**

247 g/100 cc water at 100 °C

Weast, R.C. (ed.) Handbook of Chemistry and Physics. 69th ed. Boca Raton, FL: CRC Press Inc., 1988-1989., p. B-119

▸ **Hazardous Substances Data Bank (HSDB)**

Insol in absolute alcohol

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 13th Edition, Whitehouse Station, NJ: Merck and Co., Inc., 2001., p. 1370

▸ **Hazardous Substances Data Bank (HSDB)**

0.34 wt% in methanol at 25 °C

Laue W et al; Ullmann's Encyclopedia of Industrial Chemistry. 7th ed. (2005). NY, NY: John Wiley & Sons; Nitrates and Nitrites. Online Posting Date: June 15, 2000.

▸ **Hazardous Substances Data Bank (HSDB)**

Solubility in water, g/100ml at 25 °C: 35.7

▸ **ILO International Chemical Safety Cards (ICSC)**

3.2.8 Density

2.109 (USCG, 1999)

U.S. Coast Guard. 1999. Chemical Hazard Response Information System (CHRIS) - Hazardous Chemical Data. Commandant Instruction 16465.12C. Washington, D.C.: U.S. Government Printing Office.

▸ CAMEO Chemicals

2.1 at 25 °C

Lide, D.R. CRC Handbook of Chemistry and Physics 86TH Edition 2005-2006. CRC Press, Taylor & Francis, Boca Raton, FL 2005, p. 4-80

▸ Hazardous Substances Data Bank (HSDB)

2.1 g/cm^3

▸ ILO International Chemical Safety Cards (ICSC)

3.2.9 Decomposition

When heated to decomp it emits very toxic fumes of /nitrogen oxides & dipotassium oxide/.

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 3036

▸ Hazardous Substances Data Bank (HSDB)

Boiling point 400 °C (decomp)

Weast, R.C. (ed.) Handbook of Chemistry and Physics. 69th ed. Boca Raton, FL: CRC Press Inc., 1988-1989., p. B-119

▸ Hazardous Substances Data Bank (HSDB)

... /Potassium nitrate/ decomposes on heating producing nitrogen oxides, oxygen, which increases fire hazard.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: http://www.inchem.org/documents/icsc/icsc/eics0184.htm

▸ Hazardous Substances Data Bank (HSDB)

400 °C

▸ ILO International Chemical Safety Cards (ICSC)

3.2.10 pH

4,5-8,5 (5 % solution)

▸ EU Food Improvement Agents

About 7

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 13th Edition, Whitehouse Station, NJ: Merck and Co., Inc., 2001., p. 1370

▸ Hazardous Substances Data Bank (HSDB)

3.2.11 Refractive Index

Index of refraction: 1.335 (Alpha), 1.5056 (Beta), 1.5064 (Gamma)

Laue W et al; Ullmann's Encyclopedia of Industrial Chemistry. 7th ed. (2005). NY, NY: John Wiley & Sons; Nitrates and Nitrites. Online Posting Date: June 15, 2000.

▸ Hazardous Substances Data Bank (HSDB)

3.2.12 Other Experimental Properties

Enthalpy of fusion = 11.9 kJ/mol

Laue W et al; Ullmann's Encyclopedia of Industrial Chemistry. 7th ed. (2005). NY, NY: John Wiley & Sons; Nitrates and Nitrites. Online Posting Date: June 15, 2000.

▸ Hazardous Substances Data Bank (HSDB)

In contact with air, pure molten potassium nitrate is stable up to about 530 °C. Above 750 °C, the nitrite product decomposes with the formation of nitrogen oxides.

Laue W et al; Ullmann's Encyclopedia of Industrial Chemistry. 7th ed. (2005). NY, NY: John Wiley & Sons; Nitrates and Nitrites. Online Posting Date: June 15, 2000.

▸ Hazardous Substances Data Bank (HSDB)

HEAT OF FUSION: 2840 CAL/G MOLE= 28.1 CAL/G

Weast, R.C. (ed.) Handbook of Chemistry and Physics. 69th ed. Boca Raton, FL: CRC Press Inc., 1988-1989., p. B-226

▸ Hazardous Substances Data Bank (HSDB)

TRANSITION POINT: 129 °C FROM RHOMBIC TO TRIGONAL FORM

Weast, R.C. (ed.) Handbook of Chemistry and Physics. 69th ed. Boca Raton, FL: CRC Press Inc., 1988-1989., p. B-119

▸ Hazardous Substances Data Bank (HSDB)

Transparent, slightly hygroscopic

Lewis, R.J. Sr.; Hawley's Condensed Chemical Dictionary 14th Edition. John Wiley & Sons, Inc. New York, NY 2001., p. 915

▸ Hazardous Substances Data Bank (HSDB)

Dissolves in **water** with a lowering of the temp

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 13th Edition, Whitehouse Station, NJ: Merck and Co., Inc., 2001., p. 1370

Hazardous Substances Data Bank (HSDB)

Oxidizing material

National Fire Protection Association. Fire Protection Guide on Hazardous Materials. 9th ed. Boston, MA: National Fire Protection Association, 1986., p. 49-77

Hazardous Substances Data Bank (HSDB)

4 Spectral Information

4.1 Mass Spectrometry

Technique	GC/MS
Source of Spectrum	DigiLab GmbH (C) 2020
Copyright	Database Compilation Copyright © 2020 Wiley-VCH Verlag GmbH & Co. KGaA. Copyright © 2020 DigiLab GmbH. All Rights Reserved.
Thumbnail	

SpectraBase

4.2 IR Spectra

4.2.1 FTIR Spectra

Showing 2 of 3 View More

Technique	KBr WAFER
Source of Sample	Mallinckrodt Inc., St. Louis, Missouri
Copyright	Copyright © 1980, 1981-2020 John Wiley & Sons, Inc. All Rights Reserved.
Thumbnail	

SpectraBase

Technique	KBr WAFER
Source of Sample	Mallinckrodt Inc., St. Louis, Missouri
Copyright	Copyright © 1980, 1981-2020 John Wiley & Sons, Inc. All Rights Reserved.
Thumbnail	

SpectraBase

4.2.2 ATR-IR Spectra

Source of Sample	Aldrich
Catalog Number	542040
Copyright	Copyright © 2018-2020 Sigma-Aldrich Co. LLC. - Database Compilation Copyright © 2018-2020 John Wiley & Sons, Inc. All Rights Reserved.
Thumbnail	

SpectraBase

4.3 Raman Spectra

Instrument Name	Bio-Rad FTS 175C with Raman accessory
Technique	FT-Raman
Source of Sample	Fluka Chemie AG, Buchs, Switzerland
Catalog Number	60415
Copyright	Copyright © 1980, 1981-2020 John Wiley & Sons, Inc. All Rights Reserved.
Thumbnail	

SpectraBase

Instrument Name	Bio-Rad FTS 175C with Raman accessory
Technique	FT-Raman
Source of Sample	Fluka Chemie AG, Buchs, Switzerland
Catalog Number	60415
Copyright	Copyright © 1980, 1981-2020 John Wiley & Sons, Inc. All Rights Reserved.
Thumbnail	

- SpectraBase

5 Related Records

5.1 Related Compounds with Annotation

PubChem

5.2 Component Compounds

CID 944 (Nitric acid)

CID 5462222 (Potassium)

PubChem

5.3 Related Compounds

Same Connectivity	4 Records
Mixtures, Components, and Neutralized Forms	2 Records
Similar Compounds	7 Records

PubChem

5.4 Substances

5.4.1 Related Substances

Same	162 Records

PubChem

5.4.2 Substances by Category

PubChem

5.5 Entrez Crosslinks

PubMed	6 Records

Taxonomy	1 Record
Gene	11 Records

PubChem

5.6 Associated Chemicals

Nitrate ion;14797-55-8

Hazardous Substances Data Bank (HSDB)

5.7 NCBI LinkOut

NCBI

6 Chemical Vendors

PubChem

7 Drug and Medication Information

7.1 Drug Indication

For the relief of tooth sensitivity, and is also used as a pesticide, insecticide, as a food additive, and a rodenticide [L1751, L1754, L1757].

DrugBank

7.2 Clinical Trials

7.2.1 ClinicalTrials.gov

ClinicalTrials.gov

7.3 Therapeutic Uses

Toothpastes intended to prevent caries and to reduce painful sensitivity of the teeth are regulated as over-the-counter (OTC) anticaries drug products at Title 21, Code of Federal Regulations (21 CFR), Part 355. Such products may contain up to 5% potassium nitrate as a tooth desensitizing ingredient.

57 FR 20 114 (May 11, 1992)

Hazardous Substances Data Bank (HSDB)

Dentinal hypersensitivity occurs when gingival recession exposes dentin at the cervical margins of teeth. Twenty-four periodontal patients, with postoperative hypersensitive dentin were treated by burnishing saturated potassium nitrate (KNO3) to relieve pain. Using a visual analogue scale with participants acting as their own control, a subjective assessment of pain was measured and compared before and after KNO3 application. Thirty-six regions involving 98 teeth were assessed. A significant reduction of sensitivity and pain was achieved by using a saturated KNO3 solution ($p < .0001$ Student-t).

PMID:10321150

Touyz LZ, Stern J; .Gen Dent 47 (1): 42-5 (1999)

Hazardous Substances Data Bank (HSDB)

... Potassium nitrate has been used ... in a dentifrice or gel to alleviate dentinal hypersensitivity. The aim of this study was to compare a 3% potassium nitrate/0.2% **sodium fluoride** mouthwash with a 0.2% **sodium fluoride** control mouthwash in a 6-week double-blind study. ... Fifty subjects were evaluated using 2 tactile methods and cold air sensitivity (dental air syringe), along with subjective perception of pain (0 to 10 scale) at baseline and at 2 and 6 weeks. ... There was a general decrease in dentinal hypersensitivity levels in both groups over the 6-week study period as demonstrated by all 4 methods of assessment. There was also a statistically significant difference in decrease in sensitivity between the groups. /The authors concluded that/ this study showed that a 3% potassium nitrate/0.2% **sodium fluoride** mouthwash appears to have therapeutic potential to alleviate dentinal hypersensitivity.

PMID:118115

Pereira R. Chava VK; J Periodontol 72 (12): 1720-5 (2001)

Hazardous Substances Data Bank (HSDB)

The effect on dentinal hypersensitivity from the use of a new dentifrice containing 5.0% potassium nitrate and 0.454% **stannous fluoride** in a silica base (Colgate Sensitive Maximum Strength Toothpaste, Colgate-Palmolive Co.) over an 8-week period was compared to a commercially available dentifrice containing 5.0% potassium nitrate and 0.243% **sodium fluoride** in a silica base (positive control (Sensodyne Fresh Mint Toothpaste, Block Drug Company, Inc.)) and to a commercially available nondesensitizing dentifrice containing 0.243% **sodium fluoride** in a silica base (negative control (Colgate Winterfresh Gel, Colgate-Palmolive Co.)). A total of 120 participants were stratified into 3 balanced groups according to baseline mean air blast (thermal) and tactile (Yeaple Probe) sensitivity scores, gender, and age. Participants brushed their teeth twice daily (morning and evening) for 1 minute. Dentinal hypersensitivity examinations were conducted at baseline, 4 weeks, and 8 weeks by the same dental examiner. After 4- and 8-weeks' use of their assigned products, participants in the new dentifrice group demonstrated statistically significant improvements ($p < 0.05$) in tactile and air blast sensitivity, as compared to those using the positive and negative control dentifrices.

PMID:11908358

Schiff T et al; Compend Contin Educ Dent Suppl (27): 4-10 (2000)

Hazardous Substances Data Bank (HSDB)

A multicenter clinical trial conducted by the authors compared the desensitizing efficacy of a new 5 percent potassium nitrate: 0.243 percent **sodium fluoride** dentifrice along with two clinically proven, commercially available desensitizing dentifrices to a placebo dentifrice. Sensitivity to cold air and tactile stimulation, along with patients' subjective assessments, were evaluated to assess the dentinal desensitizing efficacy of the test dentifrices. Results demonstrated that after four weeks, participants who used the new dentifrice formulation experienced significant decreases in dentinal sensitivity compared to the placebo group for all measured indexes.

PMID:8682988

Silverman G et al; J Am Dent Assoc 127 (2): 191-201 (1996)

Hazardous Substances Data Bank (HSDB)

BACKGROUND: Potassium nitrate has been used previously in a dentifrice or gel to alleviate dentinal hypersensitivity. The aim of this study was to compare a 3% potassium nitrate/0.2% **sodium fluoride** mouthwash with a 0.2% **sodium fluoride** control mouthwash in a 6-week double-blind study. METHODS: Fifty subjects were evaluated using 2 tactile methods and cold air sensitivity (dental air syringe), along with subjective perception of pain (0 to 10 scale) at baseline and at 2 and 6 weeks. RESULTS: There was a general decrease in dentinal hypersensitivity levels in both groups over the 6-week study period as demonstrated by all 4 methods of assessment. There was also a statistically significant difference in decrease in sensitivity between the groups. CONCLUSIONS: This study showed that a 3% potassium nitrate/0.2% **sodium fluoride** mouthwash appears to have therapeutic potential to alleviate dentinal hypersensitivity.

PMID:11811508

Pereira R, Chava VK; J Periodontol 72 (12): 1720-5 (2001)

▸ **Hazardous Substances Data Bank (HSDB)**

Following deep restorations in vital teeth, postoperative pain of various durations frequently occurs, even if the teeth were asymptomatic before treatment. In this study, a potassium nitrate-polycarboxylate cement was used as a liner and was found clinically to tend to preserve pulpal vitality and significantly eliminate or decrease postoperative pain.

PMID:1882043

Hodosh M et al; Quintessence Int 22 (6): 495-502 (1991)

▸ **Hazardous Substances Data Bank (HSDB)**

... The use of the KNO3 plus **fluoride** dentifrice (Sensodyne), two weeks prior to and throughout bleaching, may be a useful adjunct for the management of sensitivity caused by professionally dispensed bleaching products. With the bleaching-induced tooth sensitivity, those patients in the KNO3 plus **fluoride** toothpaste group were significantly more satisfied with their whitening experience and willing to repeat the bleaching treatment.

PMID:15974219

Haywood VB et al; J Clin Dent 16 (1): 17-22 (2005)

▸ **Hazardous Substances Data Bank (HSDB)**

MEDICATION (VET): AS INEXPENSIVE DIURETIC IN VARIOUS EDEMATOUS CONDITIONS. OFTEN USED WITH IDENTICAL DOSES OF **METHENAMINE**.

Rossoff, I.S. Handbook of Veterinary Drugs. New York: Springer Publishing Company, 1974., p. 476

▸ **Hazardous Substances Data Bank (HSDB)**

Diuretic (former use)

The Merck Index. 10th ed. Rahway, New Jersey: Merck Co., Inc., 1983., p. 1102

▸ **Hazardous Substances Data Bank (HSDB)**

7.4 Drug Warnings

VET: AVOID USE IN PRESENCE OF SEVERE RENAL IMPAIRMENT.

Rossoff, I.S. Handbook of Veterinary Drugs. New York: Springer Publishing Company, 1974., p. 476

▸ **Hazardous Substances Data Bank (HSDB)**

VET: POTASSIUM SALTS HAVE BEEN USED IN PAST AS DIURETICS BUT THEY ARE POTENTIALLY DANGEROUS & ... USE IS DISCOURAGED. /POTASSIUM SALTS/

Jones, L.M., et al. Veterinary Pharmacology & Therapeutics. 4th ed. Ames: Iowa State University Press, 1977., p. 576

▸ **Hazardous Substances Data Bank (HSDB)**

METHEMOGLOBINEMIA HAS BEEN NOTED AFTER OVERDOSE OF POTASSIUM NITRATE.

FAIVRE J ET AL; ANN NUTR ALIMENT 30 (5-6): 8 831 (1976)

▸ **Hazardous Substances Data Bank (HSDB)**

7.5 Reported Fatal Dose

The toxic dose varies greatly; from 15 to 30 g /KNO3/ may prove fatal but much larger doses have been taken without serious effects.

Reynolds, J.E.F., Prasad, A.B. (eds.) Martindale-The Extra Pharmacopoeia. 28th ed. London: The Pharmaceutical Press, 1982., p. 1746

▸ **Hazardous Substances Data Bank (HSDB)**

The lethal oral dose of potassium nitrate for an adult has been estimated to be between 4 and 30 g (about 40 to 300 mg NO3-/kg).

*IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: **http://www.inchem.org/documents/pims/chemical/pimg016.htm***

▸ **Hazardous Substances Data Bank (HSDB)**

Fatal dose for adult humans is given as 30 to 35 g KNO3 ...

*European Chemicals Bureau; IUCLID Dataset, Potassium nitrate (7757-79-1) (2000 CD-ROM edition). Available from, as of October 25, 2006: **http://esis.jrc.ec.europa.eu/***

▸ **Hazardous Substances Data Bank (HSDB)**

8 Food Additives and Ingredients

8.1 Food Additive Classes

JECFA Functional Classes

Food Additives -> COLOUR_RETENTION_AGENT; PRESERVATIVE

Joint FAO/WHO Expert Committee on Food Additives (JECFA)

8.2 FDA Substances Added to Food

Substance	POTASSIUM NITRATE
Used for (Technical Effect)	FLAVORING AGENT OR ADJUVANT
Document Number (21 CFR)	172.160 181.33 181.34

FDA Center for Food Safety and Applied Nutrition (CFSAN)

8.3 Evaluations of the Joint FAO/WHO Expert Committee on Food Additives - JECFA

Chemical Name	NITRE
Evaluation Year	1995
ADI	0-3.7 mg/kg bw
Comments	Expressed as nitrate ion; ADI does not apply to infants below the age of 3 months
Report	TRS 859-JECFA 44/29,32

Joint FAO/WHO Expert Committee on Food Additives (JECFA)

9 Pharmacology and Biochemistry

9.1 Pharmacology

The potassium cation is an essential electrolyte that is important for the maintenance of intracellular osmotic pressure and for the maintenance of cell membrane potential, in particular, the potential of electrically excitable tissues [L1736]. It is a regular component of the diet and is particularly abundant in fruit and vegetables. The recommended daily intake varies from 350-1275 mg in children to 1875 and 5625 mg in adults. In the United Kingdom, the recommended intake is 3.5 g/day for healthy adults [L1736]. Potassium ions are believed to disturb the synapse between nerve cells, thus decreasing nerve excitation and the associated pain [L1751]. Potassium nitrates are ignitable fumigants also utilized as rodenticides and insecticides. They are added to other pesticide active ingredients (sulfur and carbon) and placed into fumigant gas cartridges, designed to be ignited and placed in pest-infested areas. The activated cartridge bombs release toxic gases which are lethal to select rodents, skunks, coyotes, and wasps [L1752, L753]. Potassium ions have demonstrated in animal studies to act directly on the nerves and to reduce sensory activity [L1751]. Tooth hypersensitivity can be relieved by inactivating the intra-dental nerve and inhibiting neural transmission, using suitable medications [L1751]. It has been found that potassium-to-sodium intake ratios are strongly related to cardiovascular disease risk than either nutrient alone. The data describing this relationship warrants further research for various target tissue endpoints [A32167].

- DrugBank

Potassium Nitrate is a crystalline salt, KNO3; a strong oxidizer used especially in making gunpowder, as a fertilizer, and in medicine.

- NCI Thesaurus (NCIt)

9.2 MeSH Pharmacological Classification

Explosive Agents

Substances that are energetically unstable and can produce a sudden expansion of the material, called an explosion, which is accompanied by heat, pressure and noise. Other things which have been described as explosive that are not included here are explosive action of laser heating, human performance, sudden epidemiological outbreaks, or fast cell growth. (See all compounds classified as Explosive Agents.)

- Medical Subject Headings (MeSH)

9.3 Absorption, Distribution and Excretion

Absorption

It is established that nitrate is quickly and almost entirely absorbed from the proximal and small intestine subsequent to ingestion in most animals, with little if any absorption from the stomach and lower intestine [L1754]. The vast majority of intestinal K+ absorption occurs in the small intestine; the contribution of the normal colon to net K+ absorption and secretion is trivial [A32174].

- DrugBank

Route of Elimination

Nitrates are excreted in the urine primarily as inorganic nitrates [L1754].

- DrugBank

Volume of Distribution

Nitrates are absorbed into the general blood circulation and are transported across the body. Radioactive tracer experiments have demonstrated that nitrates are distributed evenly among body organs, and their rate of distribution depends on blood flow [L1754].

- DrugBank

It is generally assumed that absorption takes place in upper portion of small intestine & ... excretion is primarily, if not exclusively, through kidney. ... preliminary observations ... have shown that not all animals reduce nitrate to nitrite in saliva. It is of considerable significance that major differences occur among mammalian species in the ability to concn nitrate from plasma into saliva. Large interspecies differences have also been shown to occur in elimination kinetics of nitrate. /Nitrate/

National Research Council. Drinking Water & Health Volume 1. Washington, DC: National Academy Press, 1977., p. 415

- Hazardous Substances Data Bank (HSDB)

Nitrate and nitrite given orally are absorbed and transferred to the blood in the upper part of the gastrointestinal tract. Abundant pectin in the food may delay absorption which may then occur lower down in the intestine, with possible increased risk for microbial transformation of nitrate into nitrite. /Nitrate and nitrite/

IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm

- Hazardous Substances Data Bank (HSDB)

Regardless of route of exposure, nitrate and nitrite are rapidly transferred into the blood. Nitrite is gradually oxidized to nitrate which is readily distributed into most body fluids (urine, saliva, gastric juice, sweat, ileostomy fluid). Distribution of nitrate into plasma, erythrocytes, saliva and urine following an oral dose of sodium nitrate has been demonstrated ... Nitrate does not accumulate in the body. /Nitrate and nitrite/

IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm

- Hazardous Substances Data Bank (HSDB)

Approximately 60% of oral nitrate is excreted in urine ... bacterial or endogenous metabolism probably accounts for the remainder. A minor part is excreted in sweat. /Nitrate/

IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm

- Hazardous Substances Data Bank (HSDB)

... Potassium nitrate ... /is/ rapidly absorbed and excreted unchanged ... Under some circumstances, however, appreciable amt of nitrate are converted to nitrite.

Gosselin, R.E., R.P. Smith, H.C. Hodge. Clinical Toxicology of Commercial Products. 5th ed. Baltimore: Williams and Wilkins, 1984., p. III-316

- Hazardous Substances Data Bank (HSDB)

9.4 Metabolism/Metabolites

Nitrates are reduced to nitrites by the bacteria in saliva and the gastrointestinal system [L1754]. The in vivo reduction of nitrates to nitrites depends on conditions that are subject to much variations such the volume and species of microflora present in the saliva/gastrointestinal tract, and stomach pH. Gastric pH is higher in infants younger than 6 months of age and during certain gastrointestinal tract infections, thereby favoring the reduction of nitrates [L1754]. Nitrate is metabolized to a small extent. The biotransformation of potassium nitrate consists of nitrate reduction, nitrite formation, nitrite reoxidation to nitrate, and formation of methemoglobin or NO, in a dynamic equilibrium [L1752], [L1753], [L1754].

▸ DrugBank

Nitrate salts/ including potassium nitrate/ ... if not promptly absorbed, they may be reduced to nitrites by bacteria in bowel. I

Gosselin, R.E., R.P. Smith, H.C. Hodge. Clinical Toxicology of Commercial Products. 5th ed. Baltimore: Williams and Wilkins, 1984., p. II-124

▸ Hazardous Substances Data Bank (HSDB)

... nitrate metabolism in man cannot be readily predicted from animal data. Several studies have suggested that large differences in nitrate metab may occur between individuals. These differences can span about three orders of magnitude when all available data, incl diet & physiological status, are taken into consideration. /nitrate/

National Research Council. Drinking Water & Health Volume 1. Washington, DC: National Academy Press, 1977., p. 415

▸ Hazardous Substances Data Bank (HSDB)

Where bacteria are present and the environment can be anerobic, nitrate can be reduced to nitrite. The main site for this reaction is mouth and stomach, but nitrite formation in the lower intestine and in the bladder (urinary infection) may also be of some toxicological importance. Nitrite may be further reduced to nitrogen by bacteria under some conditions. In blood, nitrite transforms hemoglobin to methemoglobin and is simultaneously oxidized to nitrate. Normally methemoglobin gradually reverts to hemoglobin through enzymatic reactions. Nitrite has vasodilating properties, probably through transformation into nitric oxide (NO) or a NO-containing molecule acting as a signal factor for smooth muscle relaxation. Nitrite easily transforms into a nitrosating agent in an acidic environment and can react with a variety of compounds, eg ascorbic acid, amines, amides. Nitrosation can also be mediated by bacteria, eg in the stomach. Some reaction products are carcinogenic (eg most nitrosoamines and amides). /Nitrate and nitrite/

*IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: **http://www.inchem.org/documents/pims/chemical/pimg016.htm***

▸ Hazardous Substances Data Bank (HSDB)

BACKGROUND/AIMS: It has been suggested that dietary nitrate, after concentration in the saliva and reduction to nitrite by tongue surface bacteria, is chemically reduced to nitric oxide (NO) in the acidic conditions of the stomach. This study aimed to quantify this in humans. METHODS: Ten healthy fasting volunteers were studied twice, after oral administration of 2 mmol of potassium nitrate or potassium chloride. Plasma, salivary and gastric nitrate, salivary and gastric nitrite, and gastric headspace NO concentrations were measured over six hours. RESULTS: On the control day the parameters measured varied little from basal values. Gastric nitrate concentration was 105.3+/-13 umol/L (mean (SEM), plasma nitrate concentration was 17.9+/-2.4 umol/L, salivary nitrate concentration 92.6+/-31.6 umol/L, and nitrite concentration 53.9+/-22.8 umol/L. Gastric nitrite concentrations were minimal (< 1 mumol/l). Gastric headspace gas NO concentration was 16.4+/-5.8 parts per million (ppm). After nitrate ingestion, gastric nitrate peaked at 20 minutes at 3,430+/-832 umol/L, plasma nitrate at 134+/-7.2 umol/L, salivary nitrate at 1516.7+/-280.5 umol/L, and salivary nitrite at 761.5+/-187.7 umol/L after 20-40 minutes. Gastric nitrite concentrations tended to be low, variable, and any rise was non-sustained. Gastric NO concentrations rose considerably from 14.8+/-3.1 ppm to 89.4+/-28.6 ppm ($p < 0.0001$) after 60 minutes. All parameters remained increased significantly for the duration of the study. CONCLUSIONS: A very large and sustained increase in chemically derived gastric NO concentrations after an oral nitrate load was shown, which may be important both in host defense against swallowed pathogens and in gastric physiology.

PMID:9071933
*Full text: **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1027050***
McKnight GM et al; Gut 40 (2): 211-4 (1997)

▸ Hazardous Substances Data Bank (HSDB)

Volunteers received meals with different nitrate contents ... (i) fish with high-nitrate vegetables (ii) fish with low-nitrate vegetables, or (iii) meat or eggs with high-nitrate vegetables. At 0.5 to 2 hr after consumption, dimethylnitrosamine levels up to 7.6, 3.7 and 0.9 ug/kg gastric liquid were found for the three meals, respectively. In some cases, peaks of 16 to 30 ug/kg were found 4 to 5 hr after consumption of the meal with fish and high-nitrate vegetables. A large inter-individual variation in nitrosamine formation was observed. In some cases, diethylnitrosamine was detected at concentrations of up to 13 ug/kg, 0.53 hr after consumption of the meal with fish and high-nitrate vegetables. Dipropyl- and dibutylnitrosamine, N-nitrosopiperidine, N-nitroso-morpholine and N-nitrosopyrrolidine were not detected. In fasting gastric juice, < 0.2 to 0.7 ug dimethylnitrosamine/kg was found. /Nitrate/

*WHO; WHO Food Additives Series 35 (844): Nitrite. Available from, as of October 27, 2006: **http://www.inchem.org/documents/jecfa/jecmono/v35je13.htm***

▸ Hazardous Substances Data Bank (HSDB)

No or very slight increase in blood nitrosamine level was found in human subjects after consumption of nitrate-, nitrite-, and/or amine-rich meals /Nitrate, nitrite, and amine/

*WHO; WHO Food Additives Series 35 (844): Nitrite. Available from, as of October 27, 2006: **http://www.inchem.org/documents/jecfa/jecmono/v35je13.htm***

▸ Hazardous Substances Data Bank (HSDB)

9.5 Mechanism of Action

Potassium (K+) is the principal cation modulating the osmotic balance of the body fluids. In animals, the maintenance of normal cell volume and pressure is dependent on Na+ and K+ pumping [L1759]. Potassium transport through the hydrophobic interior of a cell membrane may be facilitated by several naturally occurring compounds that form lipid-soluble alkali metal cation complexes. Potassium has the critical role of a calcium counter-ion for numerous carboxylates, phosphates, and sulfates, and also acts to stabilize macromolecular structures [L1759]. Potassium is the primary agent for common, over the counter de-sensitizing toothpaste that prevents the transmission of nerve endings to the teeth. Potassium salts, including potassium nitrate, potassium chloride or potassium citrate work by diffusion across the dentinal tubules, causing depolarization of the nerve cells. In turn, these cells become unresponsive to excitatory stimuli. The effect of the potassium nitrate accumulates over time, and it may take several weeks for patients to notice improvement of pain symptoms [L1751]. Potassium nitrates control pests using a unique mechanism of action. Rather than directly poisoning rodents, nitrates support the combustion of charcoal in gas cartridges, promoting the production of toxic gases, which, are lethal to the target pest. The environmental protection agency in the USA (EPA) is only minimally concerned about the risk of direct human exposure to sodium or potassium nitrates, rather than pesticide accidents--typically involving skin burns or inhalation of toxic gases [L1759].

▸ DrugBank

A series of reactions is involved by which it is proposed that nitrate in water may be converted to n-nitroso cmpd that are direct carcinogenic agents. The steps in the reaction sequence are: 1. Reduction of nitrate to nitrite. 2. Reaction of nitrite with secondary amines or amides in food or water to form n-nitroso cmpd. 3. Carcinogenic reaction of n-nitroso cmpd to the extent that this series of processes actually operates in human body, nitrate has capacity to become procarcinogen. ... problem is prospective rather than realized one. /Nitrate/

National Research Council. Drinking Water & Health Volume 1. Washington, DC: National Academy Press, 1977., p. 421

▸ Hazardous Substances Data Bank (HSDB)

Acute toxicity of nitrate occurs as result of reduction to nitrite, a process that can occur under specific conditions in the stomach ... /and/ in saliva. Nitrite acts in blood to oxidize hemoglobin to methemoglobin, which does not perform as oxygen carrier to tissues ... Anoxia and death may occur. /Nitrate/

National Research Council. Drinking Water & Health Volume 1. Washington, DC: National Academy Press, 1977., p. 416

▸ Hazardous Substances Data Bank (HSDB)

Nitrates can be reduced to nitrites which can react with amines or amides and form N-nitroso cmpd (containing the group =N-N=O). N-nitroso cmpd are carcinogenic in a wide range of animal species, most are mutagenic in test systems and some have been teratogenic in animals. It is highly probable that N-nitroso cmpd also may be carcinogenic in man. Therefore exposure to N-nitroso cmpd and their precursors (**nitrite**, amines and amides) should be kept as low as practically achievable. Relationships have been sought between occurrence of stomach cancer and **nitrate** content of soil and **water** in Chile, Colombia and the United Kingdom, but none was established.

*European Chemicals Bureau; IUCLID Dataset, Potassium nitrate (7757-79-1) (2000 CD-ROM edition). Available from, as of October 26, 2006: **http://esis.jrc.ec.europa.eu/***

▸ **Hazardous Substances Data Bank (HSDB)**

Acute **nitrate** toxicity is almost always seen in infants rather than adults when it results from ingestion of well waters and vegetables high in nitrates ... /It was/ deduced that infants were prone to upset stomachs and achlorhydria. As result, stomach pH increased in alkalinity allowing **nitrate**-reducing organisms to enter and to reduce nitrates to nitrites. A gastric pH above 4 supports **nitrate**-reducing organisms ... Immature enzyme systems may also be of importance ... Fetal hemoglobin (hemoglobin F) is oxidized by **nitrite** to methemoglobin at rate twice as rapid as adult hemoglobin (hemoglobin A). Furthermore, enzymatic capacity of erythrocytes of newborn infants to reduce methemoglobin to hemoglobin appears less than that of adults. Difference is probably due to developmental deficiency in activity of DPNH-methemoglobin reductase (**diphosphopyridine nucleotide**). As opposed to adults, several clinical, physiologic and metabolic factors predispose infants to development of methemoglobinemia and acute **nitrate** poisoning. /**Nitrate** and **nitrite**/

National Research Council. Drinking Water & Health Volume 1. Washington, DC: National Academy Press, 1977., p. 420

▸ **Hazardous Substances Data Bank (HSDB)**

10 Use and Manufacturing

10.1 Use Classification

Food additives

- EU Food Improvement Agents

Food Additives -> COLOUR_RETENTION_AGENT; PRESERVATIVE -> JECFA Functional Classes

- Joint FAO/WHO Expert Committee on Food Additives (JECFA)

Cosmetics -> Oral care; Soothing

S13 | EUCOSMETICS | Combined Inventory of Ingredients Employed in Cosmetic Products (2000) and Revised Inventory (2006) | DOI:10.5281/zenodo.2624118

- NORMAN Suspect List Exchange

10.2 Uses

EPA CPDat Chemical and Product Categories

- EPA Chemical and Products Database (CPDat)

For potassium nitrate (USEPA/OPP Pesticide Code: 076103) ACTIVE products with label matches. /SRP: Registered for use in the U.S. but approved pesticide uses may change periodically and so federal, state and local authorities must be consulted for currently approved uses./

National Pesticide Information Retrieval System's USEPA/OPP Chemical Ingredients Database on Potassium Nitrate (7757-79-1). Available from, as of October 12, 2006: http://npirspublic.ceris.purdue.edu/ppis/

- Hazardous Substances Data Bank (HSDB)

MEDICATION

- Hazardous Substances Data Bank (HSDB)

MEDICATION (VET):

- Hazardous Substances Data Bank (HSDB)

Toothpastes intended to prevent caries and to reduce painful sensitivity of the teeth are regulated as over-the-counter (OTC) anticaries drug products at Title 21, Code of Federal Regulations (21 CFR), Part 355. Such products may contain up to 5% potassium nitrate as a tooth desensitizing ingredient.

57 FR 20 114 (May 11, 1992)

- Hazardous Substances Data Bank (HSDB)

Therap cat: diuretic

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 13th Edition, Whitehouse Station, NJ: Merck and Co., Inc., 2001., p. 1370

- Hazardous Substances Data Bank (HSDB)

The first registered pesticide product containing sodium or potassium nitrate dates from 1948. /As of 1991 there were/ a total of six registered products for these two active ingredients. All currently registered products are pyrotechnic fumigants designed to be ignited and placed in burrows thereby delivering lethal doses of toxic gases for the control of various rodents, coyotes and ground wasps, as well as skunks.

USEPA/Office of Pesticide Programs; Reregistration Eligibility Decision Document - Inorganic Nitrate/Nitrite (Sodium and Potassium Nitrates), September 1991. Available from, as of October 11, 2006: http://www.epa.gov/pesticides/reregistration/status.htm

- Hazardous Substances Data Bank (HSDB)

In fireworks, fluxes, pickling of meats; manufacture of glass, matches, gunpowder, blasting powders; in freezing mixtures; impregnating candle wicks; treating tobacco to make it burn evenly; tempering steel

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. 13th Edition, Whitehouse Station, NJ: Merck and Co., Inc., 2001., p. 1370

- Hazardous Substances Data Bank (HSDB)

Potassium nitrate. The food additive potassium nitrate may be safely used as a curing agent in the processing of cod roe, in an amount not to exceed 200 parts per million of the finished roe. [21CFR172.160

Revised as of April 1, 2006]

Hazardous Substances Data Bank (HSDB)

Color fixative in meats; fining agent for ceramics

SRI

Hazardous Substances Data Bank (HSDB)

Specialty fertilizer; oxidizer in solid rocket propellants

Lewis, R.J. Sr.; Hawley's Condensed Chemical Dictionary 14th Edition. John Wiley & Sons, Inc. New York, NY 2001., p. 915

Hazardous Substances Data Bank (HSDB)

In pyrophosphate copper bath

Kirk-Othmer Encyclopedia of Chemical Technology. 3rd ed., Volumes 1-26. New York, NY: John Wiley and Sons, 1978-1984., p. V8: 846 (1979)

Hazardous Substances Data Bank (HSDB)

In silver plating baths

Kirk-Othmer Encyclopedia of Chemical Technology. 3rd ed., Volumes 1-26. New York, NY: John Wiley and Sons, 1978-1984., p. V8: 853 (1979)

Hazardous Substances Data Bank (HSDB)

Heat-transfer agent

Freilich MB et al; Kirk-Othmer Encyclopedia of Chemical Technology. (2005). NY, NY: John Wiley & Sons; Potassium Compounds. Online Posting Date: December 2, 2005.

Hazardous Substances Data Bank (HSDB)

Food preservation, cheese processing, desooting in combustion processes, metallurgy, agent for controlling noxious odors during application of sewage sludge and manure... proposed as an oxidizing component in the acid-based gas generator system for the rapid inflation of automobile air bags... oxidant in chemical syntheses (e.g. alizarin).

Laue W et al; Ullmann's Encyclopedia of Industrial Chemistry. 7th ed. (2005). NY, NY: John Wiley & Sons; Nitrates and Nitrites. Online Posting Date: June 15, 2000.

Hazardous Substances Data Bank (HSDB)

... It is ... used in the manufacture of nitrites, nitrous oxide, explosives, pyrotechnics ... and special cements ... as a coloring and preserving additive to food, for coagulation of latexes, in the nuclear industry and for ... corrosion control in aqueous systems. /Nitrate/

IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm

Hazardous Substances Data Bank (HSDB)

The intended purpose of /pesticide/ products containing these active ingredients is to kill certain vertebrates and wasp pest species inhabiting burrows.

USEPA/Office of Pesticide Programs; Reregistration Eligibility Decision Document - Inorganic Nitrate/Nitrite (Sodium and Potassium Nitrates), September 1991. Available from, as of October 11, 2006: http://www.epa.gov/pesticides/reregistration/status.htm

Hazardous Substances Data Bank (HSDB)

10.2.1 Industry Uses

Adhesives and sealant chemicals
Agricultural chemicals (non-pesticidal)
Intermediates
Laboratory chemicals
Oxidizing/reducing agents
Process regulators
Processing aids, not otherwise listed
Propellants and blowing agents

https://www.epa.gov/chemical-data-reporting

EPA Chemicals under the TSCA

10.2.2 Consumer Uses

Agricultural products (non-pesticidal)
Explosive materials
Laboratory Use
Non-TSCA use
Plastic and rubber products not covered elsewhere

https://www.epa.gov/chemical-data-reporting

EPA Chemicals under the TSCA

10.3 Methods of Manufacturing

... Manufactured by direct reaction of potassium chloride with concentrated nitric acid to produce potassium nitrate and chlorine... also by action of nitric acid on caustic potash or carbonate of potash.

Farm Chemicals Handbook 1989. Willoughby, OH: Meister Publishing Co., 1989., p. B-49

Hazardous Substances Data Bank (HSDB)

Produced commercially in the United States based on the reaction of potassium chloride and nitric acid at elevated temperatures. Israel implements this reaction through a solvent extraction process.

Freilich MB et al; Kirk-Othmer Encyclopedia of Chemical Technology. (2005). NY, NY: John Wiley & Sons; Potassium Compounds. Online Posting Date: December 2, 2005.

Hazardous Substances Data Bank (HSDB)

Between the 17th and 19th centuries bacterial nitrification of nitrogen-rich organic wastes, e.g. animal feces, to potassium nitrite by piling with lime and potash was used...from mid-19th century to the 1950s conversion of Chile saltpeter with potassium chloride was the most important process... from ammonium nitrate and potassium chloride by double decomposition in aqueous solution.

Laue W et al; Ullmann's Encyclopedia of Industrial Chemistry. 7th ed. (2005). NY, NY: John Wiley & Sons; Nitrates and Nitrites. Online Posting Date: June 15, 2000.

Hazardous Substances Data Bank (HSDB)

10.4 Formulations/Preparations

Ready-to-use cartridge formulated with sulfur and carbon; designed to be ignited and placed in pest burrow.

USEPA/Office of Pesticide Programs; Reregistration Eligibility Decision Document - Inorganic Nitrate/Nitrite (Sodium and Potassium Nitrates), September 1991. Available from, as of October 11, 2006: http://www.epa.gov/pesticides/reregistration/status.htm

Hazardous Substances Data Bank (HSDB)

"POTNIT" IS TRADE NAME FOR POTASSIUM NITRATE CONTAINING 13% NITROGEN, 44% POTASH, & 0.75% MAGNESIUM SULFATE.

Farm Chemicals Handbook 1981. Willoughby, Ohio: Meister, 1981., p. B-71

Hazardous Substances Data Bank (HSDB)

Grade: commercial; CP; FCC.

Lewis, R.J. Sr.; Hawley's Condensed Chemical Dictionary 14th Edition. John Wiley & Sons, Inc. New York, NY 2001., p. 915

Hazardous Substances Data Bank (HSDB)

/Available as/ ACS grade; purified grades; standard, prill, crystalline grades

Kuney, J.H. and J.N. Nullican (eds.) Chemcyclopedia. Washington, DC: American Chemical Society, 1988., p. 203

Hazardous Substances Data Bank (HSDB)

For more Formulations/Preparations (Complete) data for POTASSIUM NITRATE (8 total), please visit the HSDB record page.

Hazardous Substances Data Bank (HSDB)

10.5 Consumption Patterns

About 86% for fertilizer; 6% in heat transfer salts; 4% in glass & ceramics; 2% in matches & pyrotechnics; and 2% for miscellaneous uses (1975)

SRI

Hazardous Substances Data Bank (HSDB)

10.6 U.S. Production

Aggregated Product Volume (EPA CDR 2016)

250,000,000 - 500,000,000 lb

https://www.epa.gov/chemical-data-reporting

EPA Chemicals under the TSCA

(1972) 4.23X10+10 g

SRI

Hazardous Substances Data Bank (HSDB)

(1975) 9.89X10+10 g

SRI

Hazardous Substances Data Bank (HSDB)

Production volumes for non-confidential chemicals reported under the Inventory Update Rule.

Year	Production Range (pounds)
1986	>500 thousandd-1 million
1990	>10 thousand-500 thousand
1994	>10 thousand-500 thousand
1998	>10 thousand-500 thousand
2002	>10 thousand-500 thousand

US EPA; Non-confidential Production Volume Information Submitted by Companies for Chemicals Under the 1986-2002 Inventory Update Rule (IUR). Nitric acid potassium salt (7757-79-1). Available from, as of November 8, 2006: http://www.epa.gov/oppt/iur/tools/data/2002-vol.html

Hazardous Substances Data Bank (HSDB)

10.7 U.S. Imports

(1972) 4.63X10+10 g

SRI

Hazardous Substances Data Bank (HSDB)

(1975) 5.35X10+10 g

SRI

Hazardous Substances Data Bank (HSDB)

(1984) 1.51X10+9 g

BUREAU OF THE CENSUS. U.S. IMPORTS FOR CONSUMPTION AND GENERAL IMPORTS 1984 p.1-350

Hazardous Substances Data Bank (HSDB)

(1986) 3.62X10+6 lb

BUREAU OF THE CENSUS. US IMPORTS FOR CONSUMPTION AND GENERAL IMPORTS 1986 P.1-516

Hazardous Substances Data Bank (HSDB)

10.8 U.S. Exports

(1972) 3.63X10+9 g

SRI

Hazardous Substances Data Bank (HSDB)

(1975) NEGLIGIBLE

SRI

Hazardous Substances Data Bank (HSDB)

10.9 General Manufacturing Information

Industry Processing Sectors

Adhesive manufacturing
Agriculture, forestry, fishing and hunting
All other basic inorganic chemical manufacturing
Explosives manufacturing
Fabricated metal product manufacturing
Miscellaneous manufacturing
Nonmetallic mineral product manufacturing (includes clay, glass, cement, concrete, lime, gypsum, and other nonmetallic mineral product manufacturing.
Pesticide, fertilizer, and other agricultural chemical manufacturing
Pharmaceutical and medicine manufacturing
Plastic material and resin manufacturing
Rubber product manufacturing
Wholesale and retail trade

EPA Chemicals under the TSCA

EPA TSCA Commercial Activity Status

Nitric acid potassium salt (1:1): ACTIVE

https://www.epa.gov/tsca-inventory

EPA Chemicals under the TSCA

Nitrate should on no account be added to baby foods. /Nitrate/

Reynolds, J.E.F., Prasad, A.B. (eds.) Martindale-The Extra Pharmacopoeia. 28th ed. London: The Pharmaceutical Press, 1982., p. 1747

Hazardous Substances Data Bank (HSDB)

Limited amt are produced by the reaction of potassium chloride and sodium nitrate ... Ammonium nitrate can be substituted for sodium nitrate. However, this method suffers economically because of the lack of markets for ammonium chloride, which is a coproduct of the reaction.

Kirk-Othmer Encyclopedia of Chemical Technology. 3rd ed., Volumes 1-26. New York, NY: John Wiley and Sons, 1978-1984., p. 18(82) 941

Hazardous Substances Data Bank (HSDB)

Milk from potassium nitrate treated cows should not be used for human consumption.

Rossoff, I.S. Handbook of Veterinary Drugs. New York: Springer Publishing Company, 1974., p. 476

Hazardous Substances Data Bank (HSDB)

Some turkeys showed incr. growth rates when /potassium nitrate. was added to their drinking water at a rate of 675 ppm of nitrate.

Rossoff, I.S. Handbook of Veterinary Drugs. New York: Springer Publishing Company, 1974., p. 476

Hazardous Substances Data Bank (HSDB)

MID /MEAT INSPECTION DIVISION (DEPARTMENT OF AGRICULTURE)/ Limitation: Source of nitrite in cured products; 7 lb/100 gal; Pickle; 3 1/2 oz/100 lb meat (dry cure); 2 3/4 oz/100 lb chopped meat.

Furia, T.E. (ed.). CRC Handbook of Food Additives. 2nd ed. Cleveland: The Chemical Rubber Co., 1972., p. 926

Hazardous Substances Data Bank (HSDB)

(... Commercially Available in the USA ... /potassium nitrate/ is being used increasingly in fertilizers for more intensive crops such as tomatoes, potatoes, tobacco, leafy vegetables, citrus, peaches, & other crops). The properties applicable to fertilizers for these crops incl: low salt concn, nitrate nitrogen, favorable nitrogen-potash ratio, negligible chlorine content, & alkaline residual action in soil. Low hygroscopicity favors either application as material or included in /fertilizer/ mixtures. It is an excellent fertilizer but cost of production still limits its general use as a farm fertilizer.

Farm Chemicals Handbook 1981. Willoughby, Ohio: Meister, 1981., p. B-71

Hazardous Substances Data Bank (HSDB)

10.10 Sampling Procedures

NIOSH 173: Analyte: Trace metals (incl **potassium**); Matrix: air; Procedure: filter collection, acid digestion /Trace metals/

U.S. Department of Health, Education Welfare, Public Health Service. Center for Disease Control, National Institute for Occupational Safety Health. NIOSH Manual of Analytical Methods. 2nd ed. Volumes 1-7. Washington, DC: U.S. Government Printing Office, 1977-present., p. V5 173-1

Hazardous Substances Data Bank (HSDB)

11 Identification

11.1 Analytic Laboratory Methods

NIOSH 173: Analyte: Trace metals (incl potassium); Matrix: air; Procedure: atomic absorption spectrophotometry; Wavelength: 766.5 nm; Range: 0.1-2.0 ug/ml or 4.2-84 ug/cu m; Precision: 3% relative standard deviation (analytical) /Trace metals/

U.S. Department of Health, Education Welfare, Public Health Service. Center for Disease Control, National Institute for Occupational Safety Health. NIOSH Manual of Analytical Methods. 2nd ed. Volumes 1-7. Washington, DC: U.S. Government Printing Office, 1977-present., p. V5 173-1

Hazardous Substances Data Bank (HSDB)

EPA Method 9200: Nitrate. Method 9200 is applicable to the analysis of ground water, drinking, surface, and saline waters, and domestic and industrial wastes. Modification can be made to remove or correct for turbidity, color, salinity, or dissolved organic compounds in the sample. The applicable range of concentration is 0.1 to 2 mg nitrate-nitrogen/l of sample. This method is based upon the reaction of the nitrate ion with brucine sulfate in a 13 N sulfuric acid solution at a temperature of 100 °C. The color of the resulting complex is measured at 410 nm. Temperature control of the color reaction is extremely critical. Twenty-seven analysts in fifteen laboratories analyzed natural-water samples containing increments (as nitrogen, nitrate) of 0.16, 0.19, 0.08, and 1.24 mg/l with the precision as the standard deviation of 0.092, 0.083, 0.245, and 0.214 mg/l, respectively. /Nitrate/

USEPA; Test Methods for Evaluating Solid Waste SW-846 (1986)

Hazardous Substances Data Bank (HSDB)

Method 418D: Chromotropic Acid Method. Two moles of nitrate react with one mole of chromotropic acid to form a yellow reaction product with maximum absorbance at 410 nm. The maximum color develops within 10 min and is stable for 24 hr. The method is recommended for the concn range 0.1 to 5 mg nitrate ion-nitrogen/l. A synthetic sample containing 1.00 mg nitrate ion-nitrogen/l was analyzed by 5 laboratories with a relative standard deviation of 8% and relative error of 3%. /Total nitrate/

Franson MA (Ed); Standard Methods for the Examination of Water and Wastewater p.397-8 (1985)

Hazardous Substances Data Bank (HSDB)

Method 418C: Reduction Method. This method uses commercially available cadmium granules treated with copper sulfate to form a copper coating. The nitrite produced is determined by diazotizing with sulfanilamide and coupling with N-(1-naphthyl)-ethylenediamine to form a highly colored azo dye that is measured colorimetrically. The applicable range of this method is 0.01 to 1.0 mg nitrate-nitrogen/l. The method especially is recommended for nitrate levels below 0.1 mg nitrogen/l where other methods lack adequate sensitivity. /Total nitrate/

Franson MA (Ed); Standard Methods for the Examination of Water and Wastewater p.394 (1985)

Hazardous Substances Data Bank (HSDB)

For more Analytic Laboratory Methods (Complete) data for POTASSIUM NITRATE (23 total), please visit the HSDB record page.

Hazardous Substances Data Bank (HSDB)

11.2 Clinical Laboratory Methods

The simultaneous determination of potassium nitrate and sodium monofluorophosphate in dentifrices by single column ion chromatography is described. Nitrate and monofluorophosphate are extracted from the dentifrice with deionized water and separated by a low capacity anion separator column with 0.2% sodium benzoate (adjusted to pH 5.8 +/- 0.1 with formic acid) as the mobile phase. A conductivity meter is used for concentration measurements. The method has been applied to commercial dentifrices containing both potassium nitrate and sodium monofluorophosphate. The mean recoveries for potassium nitrate and monofluorophosphate from spiked samples were 99.0% and 99.2%, respectively, with corresponding standard deviations of 1.73% and 2.55%. The minimum detectable concentration is 5 ug/mL for both nitrate and monofluorophosphate.

PMID:4044762
Chen SS et al; J Chromatogr Sci 23 (8): 355-9 (1985)

Hazardous Substances Data Bank (HSDB)

12 Safety and Hazards

12.1 Hazards Identification

12.1.1 GHS Classification

Showing 1 of 3 View More

Pictogram(s)	 Oxidizer Irritant
Signal	Warning
GHS Hazard Statements	H272 (95.61%): May intensify fire; oxidizer [Danger Oxidizing liquids; Oxidizing solids] H315 (59.53%): Causes skin irritation [Warning Skin corrosion/irritation] H319 (59.58%): Causes serious eye irritation [Warning Serious eye damage/eye irritation] H335 (59.4%): May cause respiratory irritation [Warning Specific target organ toxicity, single exposure; Respiratory tract irritation]
Precautionary Statement Codes	P210, P220, P221, P261, P264, P271, P280, P302+P352, P304+P340, P305+P351+P338, P312, P321, P332+P313, P337+P313, P362, P370+P378, P403+P233, P405, and P501 (The corresponding statement to each P-code can be found at the GHS Classification page.)
ECHA C&L Notifications Summary	*Aggregated GHS information provided by 2312 companies from 20 notifications to the ECHA C&L Inventory. Each notification may be associated with multiple companies.* *Reported as not meeting GHS hazard criteria by 125 of 2312 companies. For more detailed information, please visit ECHA C&L website.* *Of the 19 notification(s) provided by 2187 of 2312 companies with hazard statement code(s).* *Information may vary between notifications depending on impurities, additives, and other factors. The percentage value in parenthesis indicates the notified classification ratio from companies that provide hazard codes. Only hazard codes with percentage values above 10% are shown.*

▸ European Chemicals Agency (ECHA)

12.1.2 Hazard Classes and Categories

Showing 2 of 3 View More

Ox. Liq. 2 (95.61%)

Skin Irrit. 2 (59.53%)

Eye Irrit. 2 (59.58%)

STOT SE 2 (59.4%)

▸ European Chemicals Agency (ECHA)

Oxidizing solids - Category 3

Specific target organ toxicity - Single exposure - Category 2

Specific target organ toxicity - Repeated exposure - Category 1 (blood)

Aspiration hazard - Category 1 (blood)

▸ NITE-CMC

12.1.3 Health Hazards

Exposure can cause mild irritation of eyes, nose and throat. (USCG, 1999)

U.S. Coast Guard. 1999. Chemical Hazard Response Information System (CHRIS) - Hazardous Chemical Data. Commandant Instruction 16465.12C. Washington, D.C.: U.S. Government Printing Office.

▸ CAMEO Chemicals

12.1.4 Fire Hazards

Special Hazards of Combustion Products: May produce toxic nitrogen oxides upon decomposition. Behavior in Fire: Strong oxidizer which may react explosively when mixed with reducing agents. Mixture may detonate by heat or shock. Increases the flammability of any combustible material. (USCG, 1999)

U.S. Coast Guard. 1999. Chemical Hazard Response Information System (CHRIS) - Hazardous Chemical Data. Commandant Instruction 16465.12C. Washington, D.C.: U.S. Government Printing Office.

▸ CAMEO Chemicals

Not combustible but enhances combustion of other substances. Gives off irritating or toxic fumes (or gases) in a fire. Risk of fire and explosion on contact with reducing agents.

▸ ILO International Chemical Safety Cards (ICSC)

12.1.5 Hazards Summary

The major hazards encountered in the use and handling of potassium nitrate stem from its toxicologic properties and reactivity. Toxic by all routes (ie, inhalation, ingestion, or dermal contact), exposure to this odorless, colorless-to-white, crystalline substance may occur from its use as a fertilizer, in the manufacture of fireworks, matches, glass, ceramics, candle wicks, rocket propellants, or in the pickling of meats. Effects from exposure may include burns to the skin and eyes, diuresis, headache, nausea, or methemoglobinemia. Local exhaust ventilation close to the point of contaminant generation should be used to limit exposure. In activities and situations where over-exposure may occur, wear personal protective clothing and a self-contained breathing apparatus. If exposure should occur, immediately flush affected skin and eyes with running water for at least 15 minutes. Remove contaminated clothing and shoes at the site. While not flammable itself, potassium nitrate is a powerful oxidizer and if it comes into contact with easily oxidizable substances it may react rapidly enough to cause ignition, violent combustion or explosion. Also, potassium nitrate presents an explosion risk when shocked or heated and may produce poisonous gases in a fire. For fires involving potassium nitrate, extinguish with dry chemical, CO2, Halon, water spray, or fog. If water is used, apply from as far a distance as possible. If fire becomes uncontrollable, consider evacuation of one-half mile radius. Potassium nitrate should be stored in a cool, dry area, away from combustible

(wood, paper, oil, etc.), organic, or other readily oxidizable materials. Potassium nitrate may be shipped via air, rail, road, and water, in containers bearing the label, "Oxidizer". For small spills of potassium nitrate, place material into a clean, dry covered container. For large spills of potassium nitrate solutions, first dike far ahead of the spill to prevent it from entering water sources and sewers, then take up with sand, earth, or other noncombustible absorbent material.

- Hazardous Substances Data Bank (HSDB)

12.1.6 Fire Potential

Not combustible but enhances combustion of other substances ... Risk of fire and explosion on contact with reducing agents.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: http://www.inchem.org/documents/icsc/icsc/eics0184.htm

- Hazardous Substances Data Bank (HSDB)

Dangerous fire ... risk when shocked or heated ...

Lewis, R.J. Sr.; Hawley's Condensed Chemical Dictionary 14th Edition. John Wiley & Sons, Inc. New York, NY 2001., p. 915

- Hazardous Substances Data Bank (HSDB)

12.1.7 Skin, Eye, and Respiratory Irritations

... /Potassium nitrate/ is irritating to the eyes, the skin and the respiratory tract.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: http://www.inchem.org/documents/icsc/icsc/eics0184.htm

- Hazardous Substances Data Bank (HSDB)

12.2 Safety and Hazard Properties

12.2.1 Explosive Limits and Potential

Risk of fire and explosion on contact with reducing agents.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: http://www.inchem.org/documents/icsc/icsc/eics0184.htm

- Hazardous Substances Data Bank (HSDB)

Dangerous ... explosion risk when shocked or heated ...

Lewis, R.J. Sr.; Hawley's Condensed Chemical Dictionary 14th Edition. John Wiley & Sons, Inc. New York, NY 2001., p. 915

- Hazardous Substances Data Bank (HSDB)

12.3 First Aid Measures

12.3.1 First Aid

Get medical attention. INHALATION: Remove to fresh air. EYES: Flush with water for at least 15 min., lifting lids occasionally. SKIN: Remove contaminated clothing and shoes. Flush with water. (USCG, 1999)

U.S. Coast Guard. 1999. Chemical Hazard Response Information System (CHRIS) - Hazardous Chemical Data. Commandant Instruction 16465.12C. Washington, D.C.: U.S. Government Printing Office.

- CAMEO Chemicals

12.3.2 Inhalation First Aid

Fresh air, rest. Refer for medical attention.

- ILO International Chemical Safety Cards (ICSC)

12.3.3 Skin First Aid

Remove contaminated clothes. Rinse and then wash skin with water and soap.

- ILO International Chemical Safety Cards (ICSC)

12.3.4 Eye First Aid

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

- ILO International Chemical Safety Cards (ICSC)

12.3.5 Ingestion First Aid

Rinse mouth. Refer for medical attention .

- ILO International Chemical Safety Cards (ICSC)

12.4 Fire Fighting

Excerpt from ERG Guide 140 [Oxidizers]: SMALL FIRE: Use water. Do not use dry chemicals or foams. CO2 or Halon® may provide limited control. LARGE FIRE: Flood fire area with water from a distance. Do not move cargo or vehicle if cargo has been exposed to heat. Move containers from fire area if you can do it without risk. FIRE INVOLVING TANKS OR CAR/TRAILER LOADS: Fight fire

from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. (ERG, 2016)

U.S. Department of Transportation, Transport Canada, and Secretariat of Communications and Transport of Mexico, with collaboration from Argentina's Centro de Información Química para Emergencias. 2016 Emergency Response Guidebook. ***https://www.phmsa.dot.gov/hazmat/outreach-training/erg*** *(accessed April 26, 2016).*

▸ CAMEO Chemicals

In case of fire in the surroundings, use appropriate extinguishing media.

▸ ILO International Chemical Safety Cards (ICSC)

12.4.1 Fire Fighting Procedures

If material on fire or involved in fire: Flood with water. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible.

Association of American Railroads; Bureau of Explosives. Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads, Pueblo, CO. 2005, p. 744

▸ Hazardous Substances Data Bank (HSDB)

If fire becomes uncontrollable--consider evacuation of one-half (1/2) mile radius.

Association of American Railroads; Bureau of Explosives. Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads, Pueblo, CO. 2005, p. 744

▸ Hazardous Substances Data Bank (HSDB)

12.4.2 Firefighting Hazards

Evaporation at 20 °C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: ***http://www.inchem.org/documents/icsc/icsc/eics0184.htm***

▸ Hazardous Substances Data Bank (HSDB)

12.5 Accidental Release Measures

12.5.1 Isolation and Evacuation

Excerpt from ERG Guide 140 [Oxidizers]: As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids. LARGE SPILL: Consider initial downwind evacuation for at least 100 meters (330 feet). FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2016)

U.S. Department of Transportation, Transport Canada, and Secretariat of Communications and Transport of Mexico, with collaboration from Argentina's Centro de Información Química para Emergencias. 2016 Emergency Response Guidebook. ***https://www.phmsa.dot.gov/hazmat/outreach-training/erg*** *(accessed April 26, 2016).*

▸ CAMEO Chemicals

12.5.2 Spillage Disposal

Sweep spilled substance into plastic or glass containers. Wash away remainder with plenty of water.

▸ ILO International Chemical Safety Cards (ICSC)

12.5.3 Cleanup Methods

Sweep spilled substance into plastic or glass containers. Wash away remainder with plenty of water.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: ***http://www.inchem.org/documents/icsc/icsc/eics0184.htm***

▸ Hazardous Substances Data Bank (HSDB)

12.5.4 Disposal Methods

SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational exposure or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal, aquatic, and plant life; and conformance with environmental and public health regulations.

▸ Hazardous Substances Data Bank (HSDB)

12.5.5 Preventive Measures

SRP: The scientific literature for the use of contact lenses in industry is conflicting. The benefit or detrimental effects of wearing contact lenses depend not only upon the substance, but also on factors including the form of the substance, characteristics and duration of the exposure, the uses of other eye protection equipment, and the hygiene of the lenses. However, there may be individual substances whose irritating or corrosive properties are such that the wearing of contact lenses would be harmful to the eye. In those specific cases, contact lenses should not be worn. In any event, the usual eye protection equipment should be worn even when contact lenses are in place.

▸ Hazardous Substances Data Bank (HSDB)

SRP: Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants.

▸ Hazardous Substances Data Bank (HSDB)

If material not on fire and not involved in fire: Keep sparks, flames, and other sources of ignition away. Keep material out of water sources and sewers.

Association of American Railroads; Bureau of Explosives. Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads, Pueblo, CO. 2005, p. 744

Hazardous Substances Data Bank (HSDB)

Personnel protection: Do not handle broken packages unless wearing appropriate personal protective equipment. Wash away any material which may have contacted the body with copious amounts of water or soap and water. Approach fire with caution.

Association of American Railroads; Bureau of Explosives. Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads, Pueblo, CO. 2005, p. 744

Hazardous Substances Data Bank (HSDB)

NO contact with combustibles or reducing agents ... PREVENT DISPERSION OF DUST ... Local exhaust or breathing protection ... Do not eat, drink, or smoke during work. Wash hands before eating ... Rinse contaminated clothes (fire hazard) with plenty of water. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: http://www.inchem.org/documents/icsc/icsc/eics0184.htm

Hazardous Substances Data Bank (HSDB)

Approximately 14 million households in the United States use private wells to supply their drinking water (Bureau of the Census 1993). In agricultural areas, nitrogen-based fertilizers are a major source of contamination for shallow groundwater aquifers that provide drinking water. A recent United States Geological Survey study showed that >8,200 wells nationwide were contaminated with nitrate levels above the U.S. Environmental Protection Agency (EPA) drinking water standard of 10 parts per million (ppm). ... Because of the risks for potential adverse health effects, persons who use drinking water that contains nitrate levels >10 milligrams per liter (mg/L) should have alternative sources of water or appropriate treatment of existing supplies. Information regarding testing of well water can be obtained from city or county health departments. Other sources of nitrate contamination are organic animal wastes and contamination from septic sewer systems, especially in wells <100 feet deep. During spring melt or drought conditions, both domestic wells and public water systems using surface water can show increased nitrate levels. /Nitrate/

ATSDR; Case Studies in Environmental Medicine. NITRATE/NITRITE TOXICITY. 32p. Course: SS3054. Revision Date: January 2001 Original Date: October 1991 Expiration Date: January 2007.

Hazardous Substances Data Bank (HSDB)

12.6 Handling and Storage

12.6.1 Nonfire Spill Response

Excerpt from ERG Guide 140 [Oxidizers]: Keep combustibles (wood, paper, oil, etc.) away from spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Do not get water inside containers. SMALL DRY SPILL: With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area. SMALL LIQUID SPILL: Use a non-combustible material like vermiculite or sand to soak up the product and place into a container for later disposal. LARGE SPILL: Dike far ahead of liquid spill for later disposal. Following product recovery, flush area with water. (ERG, 2016)

U.S. Department of Transportation, Transport Canada, and Secretariat of Communications and Transport of Mexico, with collaboration from Argentina's Centro de Información Química para Emergencias. 2016 Emergency Response Guidebook. https://www.phmsa.dot.gov/hazmat/outreach-training/erg (accessed April 26, 2016).

CAMEO Chemicals

12.6.2 Safe Storage

Separated from combustible substances and reducing agents.

ILO International Chemical Safety Cards (ICSC)

12.6.3 Storage Conditions

Separated from combustible and reducing substances.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: http://www.inchem.org/documents/icsc/icsc/eics0184.htm

Hazardous Substances Data Bank (HSDB)

12.7 Exposure Control and Personal Protection

12.7.1 Other Standards Regulations and Guidelines

Threshold limit value for potassium nitrate in the air at the workplace as applied in USSR: 5 mg/cu m /From table/

Seiler, H.G., H. Sigel and A. Sigel (eds.). Handbook on the Toxicity of Inorganic Compounds. New York, NY: Marcel Dekker, Inc. 1988., p. 838

Hazardous Substances Data Bank (HSDB)

12.7.2 Inhalation Risk

Evaporation at 20 °C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

ILO International Chemical Safety Cards (ICSC)

12.7.3 Effects of Short Term Exposure

The substance is irritating to the eyes, skin and respiratory tract. Ingestion could cause effects on the blood. This may result in the formation of methaemoglobin. The effects may be delayed. Medical observation is indicated.

ILO International Chemical Safety Cards (ICSC)

12.7.4 Personal Protective Equipment (PPE)

Full cover clothing and chemical goggles. Use approved respirator to protect against dust. (USCG, 1999)

U.S. Coast Guard. 1999. Chemical Hazard Response Information System (CHRIS) - Hazardous Chemical Data. Commandant Instruction 16465.12C. Washington, D.C.: U.S. Government Printing Office.

CAMEO Chemicals

Wear rubber gloves, safety glasses, protective work gowns.

ITII. Toxic and Hazarous Industrial Chemicals Safety Manual. Tokyo, Japan: The International Technical Information Institute, 1982., p. 434

▸ Hazardous Substances Data Bank (HSDB)

12.7.5 Fire Prevention

NO contact with combustible substances or reducing agents.

▸ ILO International Chemical Safety Cards (ICSC)

12.7.6 Exposure Prevention

PREVENT DISPERSION OF DUST!

▸ ILO International Chemical Safety Cards (ICSC)

12.7.7 Inhalation Prevention

Use local exhaust or breathing protection.

▸ ILO International Chemical Safety Cards (ICSC)

12.7.8 Skin Prevention

Protective gloves.

▸ ILO International Chemical Safety Cards (ICSC)

12.7.9 Eye Prevention

Wear safety goggles.

▸ ILO International Chemical Safety Cards (ICSC)

12.7.10 Ingestion Prevention

Do not eat, drink, or smoke during work. Wash hands before eating.

▸ ILO International Chemical Safety Cards (ICSC)

12.8 Stability and Reactivity

12.8.1 Air and Water Reactions

Soluble in water.

▸ CAMEO Chemicals

12.8.2 Reactive Group

Nitrate and Nitrite Compounds, Inorganic

▸ CAMEO Chemicals

12.8.3 Reactivity Alerts

Strong Oxidizing Agent

▸ CAMEO Chemicals

12.8.1 CSL Reaction Information

CSL No	CSL00099
Reactants/Reagents	Decolorizing carbon; POTASSIUM NITRATE
GHS Category	Explosive
Warning Message	Potentially explosive
Source Reference	User-Reported
CSL Status	Approved
Modified Date	8/7/2018

▸ Pistoia Alliance Chemical Safety Library

12.8.4 Reactivity Profile

POTASSIUM NITRATE mixed with alkyl esters may explode, owing to the formation of alkyl nitrates; mixtures with phosphorus, tin (II) chloride, or other reducing agents may react explosively [Bretherick 1979. p. 108-109]. Powdered antimony mixed with potassium nitrate explodes when heated [Mellor 9:282 1946-47]. A mixture of antimony trisulfide and potassium nitrate explodes at a red heat [Mellor 9:524. 1946-47]. Arsenic disulfide forms explosive mixtures when mixed with potassium nitrate, [Mellor 9:270.1946-47]. A mixture of sodium acetate and potassium nitrate may cause an explosion [Pieters 1957. p. 30]. A mixture of potassium nitrate and sodium hypophosphite constitutes a powerful explosive [Mellor 8:881. 1946-47]. A mixture of powdered zirconium and potassium nitrate explodes when heated above the melting point [Mellor 7:116. 1946-47].

CAMEO Chemicals

12.8.5 Hazardous Reactivities and Incompatibilities

A micro Parr calorimeter exploded when the wrong proportions of these ingredients were used. The intended mixture was 4.0 g sodium peroxide, 0.2 g dextrose, and 0.2 g potassium nitrate; actual proportions were 0.35 g, 2.59 g, and 0.2 g respectively. There was insufficient sodium peroxide to dissolve decomposition gases, hence a rapid temp and pressure build-up caused the Parr bomv to burst.

Fire Protection Guide to Hazardous Materials. 13 ed. Quincy, MA: National Fire Protection Association, 2002., p. 491-183

Hazardous Substances Data Bank (HSDB)

... A mixture of potassium nitrate and sodium hypophosphite constitutes a powerful explosive.

Fire Protection Guide to Hazardous Materials. 13 ed. Quincy, MA: National Fire Protection Association, 2002., p. 491-161

Hazardous Substances Data Bank (HSDB)

A mixture of arsenic and potassium nitrate explodes when ignited.

Fire Protection Guide to Hazardous Materials. 13 ed. Quincy, MA: National Fire Protection Association, 2002., p. 491-25

Hazardous Substances Data Bank (HSDB)

A batch of 3,257 g of boron, 9362 g of potassium nitrate, 989 g of laminac, and 500 g of trichloroethylene had been mixing for 5 min, when an explosion occurred.

Fire Protection Guide to Hazardous Materials. 13 ed. Quincy, MA: National Fire Protection Association, 2002., p. 491-200

Hazardous Substances Data Bank (HSDB)

Powdered zinc and potassium nitrate explode if heated.

Fire Protection Guide to Hazardous Materials. 13 ed. Quincy, MA: National Fire Protection Association, 2002., p. 491-207

Hazardous Substances Data Bank (HSDB)

A mixture of potassium nitrate ... and calcium silicide (60:40) is a readily ignited primer which burns at a very high temp. It is capable of initiating many high-temp reactions ...

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1302

Hazardous Substances Data Bank (HSDB)

When chlorinated phenols are heated for analytical purposes with calcium hydroxide-potassium nitrate mixtures, chlorinated benzodioxins analogous to the extremely toxic tetrachlorodibenzodioxin may be formed.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 925

Hazardous Substances Data Bank (HSDB)

The /chromium/ nitride deflagrates with the molten /potassium/ nitrate.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1302

Hazardous Substances Data Bank (HSDB)

... Mixtures of white phosphorus and potassium nitrate explode on percussion, and a mixture with red phosphorus reacts vigorously on heating.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1303

Hazardous Substances Data Bank (HSDB)

Mixtures of potassium nitrate with sodium phosphinate and sodium thiosulfate are explosive, the former being rather powerful.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1303

Hazardous Substances Data Bank (HSDB)

When organic matter is destroyed for residue analysis by heating with equimolar potassium nitrate-sodium nitrate mixture to 390 °C, a 20-fold excess of nitrate must be used. If over 10% of organic matter is present, pyrotechnic reaction occur which could be explosive ...

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1672

Hazardous Substances Data Bank (HSDB)

A pyrotechnic mixture of aluminium powder with potassium perchlorate, barium nitrate, potassium nitrate and water exploded after 24 hr storage under water. Tests revealed the exothermic interaction of finely divided aluminium with nitrate and water to produce ammonia and aluminium hydroxide. Under the conditions prevailing in the stored mixture, the reaction would be expected to accelerate, finally involving the perchlorate as oxidant and causing ignition of the mixture.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 28

Hazardous Substances Data Bank (HSDB)

Aluminium powder, barium nitrate, potassium nitrate, sulfur and vegetable adhesives, mixed to a paste with water, exploded on 2 occasions. Lab investigation showed initial interaction of water and aluminium to produce hydrogen. It was supposed that nascent hydrogen reduced the nitrates present, increasing the alkalinity and thence the rate of attack on aluminium, the reaction becoming self-accelerating. Cause of ignition was unknown ...

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 28

Hazardous Substances Data Bank (HSDB)

Heating the bis(trichloromethyl)benzene with potassium nitrate ... to effect conversion to the bis(acyl chloride) led to eruptions at higher temp, and was too dangerous to pursue.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 732

Hazardous Substances Data Bank (HSDB)

Thermal reaction hazards of potassium nitrate-**cellulose** mixtures were evaluated ... stoichiometric mixture (zero **oxygen** balance) showed the lowest ignition temp.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1302

Hazardous Substances Data Bank (HSDB)

Explosion hazards of mixtures of **lactose monohydrate** with ... potassium nitrate ... are assessed.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 853

Hazardous Substances Data Bank (HSDB)

Mixtures of potassium nitrate and powdered **titanium**, **antimony** or **germanium** explode on heating, and with **zirconium** at the fusion temp of the mixture.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1302

Hazardous Substances Data Bank (HSDB)

Mixtures of potassium nitrate with antimony trisulfide, **barium sulfide**, calcium sulfide, **germanium monosulfide** or **titanium disulfide** all explode on heating. The mixture with arsenic disulfide is detonable, and addition of **sulfur** gives a pyrotechnic composition. Mixtures with **molybdenum disulfide** are also detonable. Interaction with sulfides in molten mixtures is violent.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1302

Hazardous Substances Data Bank (HSDB)

Boron phosphide ignites in molten nitrates; mixtures of the **nitrate** with **copper(II) phosphide** explode on heating, and that with copper monophosphide explodes on impact.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1303

Hazardous Substances Data Bank (HSDB)

A pyrotechnic blend of a finely divided mixture /of potassium nitrate/ with **boron** ignited and exploded when the **aluminium** container was dropped; (the **aluminium** container also may have been involved). **Boron** is not attacked at below 400 °C, but is at fusion temp or at lower temp if decomposition products (nitrites) are present. The mixture has also been evaluated as a propellant.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1303

Hazardous Substances Data Bank (HSDB)

... Contact of powdered **carbon** with the /**potassium**/ **nitrate** at 290 °C causes vigorous combustion and a mixture explodes on heating. Gunpowder is the oldest known explosive and contains potassium nitrate, **charcoal** and **sulfur**, the latter to reduce ignition temp and to increase the speed of combustion ...

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1303

Hazardous Substances Data Bank (HSDB)

Potassium nitrate in cloth sacks stowed next to baled peat moss became involved in a ship fire and caused rapid flame spread and explosions. Heat transfer salt from a new supplier was added to a pilot plant reactor salt bath. Some 12 hr after start of heating to melt the bath contents a muffled explosion occurred, attributed to presence of organic impurities in the new salt.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 1303

Hazardous Substances Data Bank (HSDB)

... Contact of the /**thorium**/ dicarbide with molten ... potassium nitrate ... causes incandescence.

Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 329

Hazardous Substances Data Bank (HSDB)

Fluorine attacks potassium nitrate to give **fluorine nitrate**.

Fire Protection Guide to Hazardous Materials. 13 ed. Quincy, MA: National Fire Protection Association, 2002., p. 491-88

Hazardous Substances Data Bank (HSDB)

A mixture of ... /potassium nitrate and **sodium acetate**/ may cause an explosion.

Fire Protection Guide to Hazardous Materials. 13 ed. Quincy, MA: National Fire Protection Association, 2002., p. 491-161

Hazardous Substances Data Bank (HSDB)

A mixture of ... /**sulfur**, potassium nitrate and **arsenic trisulfide**/ is a known pyrotechnic formulation.

Fire Protection Guide to Hazardous Materials. 13 ed. Quincy, MA: National Fire Protection Association, 2002., p. 491-189

Hazardous Substances Data Bank (HSDB)

12.9 Transport Information

12.9.1 DOT Emergency Guidelines

/GUIDE 140: OXIDIZERS/ Fire or Explosion: These substances will accelerate burning when involved in a fire. Some may decompose explosively when heated or involved in a fire. May explode from heat or contamination. Some will react explosively with hydrocarbons (fuels). May ignite combustibles (wood, paper, oil, clothing, etc.). Containers may explode when heated. Runoff may create fire or explosion hazard.

U.S. Department of Transportation. 2012 Emergency Response Guidebook. Washington, D.C. 2012

Hazardous Substances Data Bank (HSDB)

/GUIDE 140: OXIDIZERS/ Health: Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe injury, burns or death. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution.

U.S. Department of Transportation. 2012 Emergency Response Guidebook. Washington, D.C. 2012

Hazardous Substances Data Bank (HSDB)

/GUIDE 140: OXIDIZERS/ Public Safety: CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover. As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering.

U.S. Department of Transportation. 2012 Emergency Response Guidebook. Washington, D.C. 2012

Hazardous Substances Data Bank (HSDB)

/GUIDE 140: OXIDIZERS/ Protective Clothing: Wear positive pressure self-contained breathing apparatus (SCBA). Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection. Structural firefighters' protective clothing will only provide limited protection.

U.S. Department of Transportation. 2012 Emergency Response Guidebook. Washington, D.C. 2012

Hazardous Substances Data Bank (HSDB)

For more DOT Emergency Guidelines (Complete) data for POTASSIUM NITRATE (8 total), please visit the HSDB record page.

Hazardous Substances Data Bank (HSDB)

12.9.2 DOT ID and Guide

1486 140

DOT Emergency Response Guidebook

12.9.3 Shipping Name/ Number DOT/UN/NA/IMO

UN 1486; Potassium nitrate

Hazardous Substances Data Bank (HSDB)

IMO 5.1; Potassium nitrate

Hazardous Substances Data Bank (HSDB)

12.9.4 Standard Transportation Number

49 187 37; Potassium nitrate

Hazardous Substances Data Bank (HSDB)

12.9.5 Shipment Methods and Regulations

No person may /transport,/ offer or accept a hazardous material for transportation in commerce unless that person is registered in conformance ... and the hazardous material is properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized by ... /the hazardous materials regulations (49 CFR 171-177)./

49 CFR 171.2; U.S. National Archives and Records Administration's Electronic Code of Federal Regulations. Available from, as of February 15, 2006: http://www.ecfr.gov

Hazardous Substances Data Bank (HSDB)

The International Air Transport Association (IATA) Dangerous Goods Regulations are published by the IATA Dangerous Goods Board pursuant to IATA Resolutions 618 and 619 and constitute a manual of industry carrier regulations to be followed by all IATA Member airlines when transporting hazardous materials.

International Air Transport Association. Dangerous Goods Regulations. 47th Edition. Montreal, Quebec Canada. 2006., p. 241

Hazardous Substances Data Bank (HSDB)

The International Maritime Dangerous Goods Code lays down basic principles for transporting hazardous chemicals. Detailed recommendations for individual substances and a number of recommendations for good practice are included in the classes dealing with such substances. A general index of technical names has also been compiled. This index should always be consulted when attempting to locate the appropriate procedures to be used when shipping any substance or article.

International Maritime Organization. International Maritime Dangerous Goods Code. London, UK. 2004., p. 70

Hazardous Substances Data Bank (HSDB)

12.9.6 DOT Label

Oxidizer

CAMEO Chemicals

12.9.7 UN Classification

UN Hazard Class: 5.1; UN Pack Group: III

ILO International Chemical Safety Cards (ICSC)

12.10 Regulatory Information

12.10.1 Federal Drinking Water Standards

EPA 10,000 ug/L /Nitrate ion/

USEPA/Office of Water; Federal-State Toxicology and Risk Analysis Committee (FSTRAC). Summary of State and Federal Drinking Water Standards and Guidelines (11/93) To Present

Hazardous Substances Data Bank (HSDB)

12.10.2 Federal Drinking Water Guidelines

EPA 10,000 ug/L /Nitrate ion/

USEPA/Office of Water; Federal-State Toxicology and Risk Analysis Committee (FSTRAC). Summary of State and Federal Drinking Water Standards and Guidelines (11/93) To Present

Hazardous Substances Data Bank (HSDB)

12.10.3 State Drinking Water Guidelines

(ME) MAINE 10000 ug/l /Nitrate ion/

USEPA/Office of Water; Federal-State Toxicology and Risk Analysis Committee (FSTRAC). Summary of State and Federal Drinking Water Standards and Guidelines (11/93) To Present

Hazardous Substances Data Bank (HSDB)

(MN) MINNESOTA 10000 ug/l /Nitrate ion/

USEPA/Office of Water; Federal-State Toxicology and Risk Analysis Committee (FSTRAC). Summary of State and Federal Drinking Water Standards and Guidelines (11/93) To Present

Hazardous Substances Data Bank (HSDB)

12.10.4 FIFRA Requirements

Section 4(g)(2)(A) of FIFRA calls for the Agency to determine, after submission of relevant data concerning an active ingredient, whether products containing the active ingredient are eligible for reregistration. The Agency has previously identified and required or waived the submission of the generic (i.e., active ingredient specific) data required to support reregistration of products containing sodium or potassium nitrate as an active ingredient. The Agency has completed its review of these generic data and information from published literature, and has determined that the data are sufficient to support reregistration of products containing sodium or potassium nitrate.

USEPA/Office of Pesticide Programs; Reregistration Eligibility Decision Document - Inorganic Nitrate/Nitrite (Sodium and Potassium Nitrates) September 1991. Available from, as of October 11, 2006: http://www.epa.gov/pesticides/reregistration/status.htm

Hazardous Substances Data Bank (HSDB)

As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their future use. Under this pesticide reregistration program, EPA examines health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether they are eligible for reregistration. In addition, all pesticides must meet the new safety standard of the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA '88 were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern and List D pesticides of less concern. Potassium nitrate is found on List D. Case No: 4052; Pesticide type: rpdenticide, antimicrobial; Case Status: RED Approved 9/91; OPP has made a decision that some/all uses of the pesticide are eligible for reregistration, as reflected in a Reregistration Eligibility Decision (RED) document .; Active ingredient (AI): potassium nitrate; Data Call-in (DCI) Date(s): 1/15/92; AI Status: OPP has completed a Reregistration Eligibility Decision (RED) for the case/AI..

United States Environmental Protection Agency/ Prevention, Pesticides and Toxic Substances; Status of Pesticides in Registration, Reregistration, and Special Review. (1998) EPA 738-R-98-002, p. 318

Hazardous Substances Data Bank (HSDB)

12.10.5 FDA Requirements

The food additive potassium nitrate may be safely used as a curing agent in the processing of cod roe, in an amount not to exceed 200 parts per million of the finished roe.

21 CFR 172.160; U.S. National Archives and Records Administration's Electronic Code of Federal Regulations. Available from, as of August 30, 2006: http://www.ecfr.gov

Hazardous Substances Data Bank (HSDB)

Sodium nitrate and potassium nitrate are subject to prior sanctions issued by the U.S. Department of Agriculture for use as sources of nitrite, with or without sodium or potassium nitrite, in the production of cured red meat products and cured poultry products.

21 CFR 181.33; U.S. National Archives and Records Administration's Electronic Code of Federal Regulations. Available from, as of August 30, 2006: http://www.ecfr.gov

Hazardous Substances Data Bank (HSDB)

Drug products containing certain active ingredients offered over-the-counter (OTC) for certain uses. A number of active ingredients have been present in OTC drug products for various uses, as described below. However, based on evidence currently available, there are inadequate data to establish general recognition of the safety and effectiveness of these ingredients for the specified uses: potassium nitrate is included in orally administered menstrual drug products.

21 CFR 310.545(a)(24); U.S. National Archives and Records Administration's Electronic Code of Federal Regulations. Available from, as of August 30, 2006: http://www.ecfr.gov

Hazardous Substances Data Bank (HSDB)

12.11 Other Safety Information

12.11.1 Toxic Combustion Products

... /Potassium nitrate/ decomposes on heating producing nitrogen oxides, oxygen, which increases fire hazard.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: http://www.inchem.org/documents/icsc/icsc/eics0184.htm

Hazardous Substances Data Bank (HSDB)

12.11.2 History and Incidents

14 infants suffered methemoglobinemia after eating spinach that was high in nitrates and had been cooked at least a day in advance. The nitrates had become nitrites during storage. Infants can tolerate fairly high levels of **nitrate** in spinach, but not **nitrite**. Infants fed spinach containing 680 ppm **nitrate** at 16-21 mg **nitrate** per kg bw per day for a week had no adverse effects. ... The first case of an infant poisoning due to nitrates in drinking **water** was reported in 1944. Since then, the number of cases has climbed steadily. There were about 2000 cases of methemoglobinemia in infants reported between 1945 and 1970, with approximately 160 being fatal. Infants consuming milk formula made with **water** containing **nitrate** levels greater than the 45 ppm allowable limit are at greatest risk. /Nitrites and nitrates/

Wetzlich S; II Nitrates. Cooperative Extension University of California Environmental Toxicology Newsletter. 11(1). (March 1991)

▸ **Hazardous Substances Data Bank (HSDB)**

12.11.3 Special Reports

USEPA/Office of Pesticide Programs; Reregistration Eligibility Decision Document - Inorganic **Nitrate**/**Nitrite** (**Sodium** and Potassium Nitrates), September 1991. The RED summarizes the risk assessment conclusions and outlines any risk reduction measures necessary for the pesticide to continue to be registered in the U.S.[Available from, as of October 11, 2006: http://www.epa.gov/pesticides/reregistration/status.htm]

▸ **Hazardous Substances Data Bank (HSDB)**

13 Toxicity

13.1 Toxicological Information

13.1.1 NIOSH Toxicity Data

▸ The National Institute for Occupational Safety and Health (NIOSH)

13.1.2 Exposure Routes

The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

▸ ILO International Chemical Safety Cards (ICSC)

13.1.3 Inhalation Symptoms

Cough. Sore throat.

▸ ILO International Chemical Safety Cards (ICSC)

13.1.4 Skin Symptoms

Redness.

▸ ILO International Chemical Safety Cards (ICSC)

13.1.5 Eye Symptoms

Redness. Pain.

▸ ILO International Chemical Safety Cards (ICSC)

13.1.6 Ingestion Symptoms

Abdominal pain. Blue lips, fingernails and skin. Dizziness. Laboured breathing. Confusion. Convulsions. Diarrhoea. Headache. Nausea. Unconsciousness.

▸ ILO International Chemical Safety Cards (ICSC)

13.1.7 Acute Effects

▸ ChemIDplus

13.1.8 Interactions

Nitrates have long been considered as harmful dietary components and judged responsible for deleterious effects on human health, leading to stringent regulations concerning their levels in food and water. However, recent studies demonstrate that dietary nitrate may have a major role in human health as a non-immune mechanism for host defense, through its metabolism to NO in the stomach. NO is a versatile molecule and although evidence exists showing that administration of low doses of exogenous NO protects against gastrointestinal inflammation, higher NO doses have been shown to exacerbate injury. So, the effect of an ingestion of nitrates in doses corresponding to a normal diet in human consumers on an experimental gastritis induced by iodoacetamide in rats was investigated. During gastritis one of the following compounds was given orally: water; potassium nitrate; the NO donor sodium nitroprusside; the NO scavenger haemoglobin given with either water or potassium nitrate. N(G)-nitro-l-arginine methyl ester (l-NAME), a non-specific NO synthase inhibitor, was administered with either water, iodoacetamide alone, or combined with potassium nitrate. After killing, the stomach was resected and microscopic damage scores, myeloperoxidase and NO synthase activities were determined. Iodoacetamide-induced gastritis was significantly reduced by potassium nitrate administration, an effect which was reproduced by sodium nitroprusside and reversed by hemoglobin. l-NAME induced gastric mucosal damage in itself, and potassium nitrate did not prevent the gastritis induced by iodoacetamide associated with l-NAME. In conclusion, dietary nitrate exerts a protective effect against an experimental gastritis in rats by releasing NO in the stomach but such an effect requires the production of endogenous NO. /Nitrates/

PMID:12828794
Larauche M et al; Br J Nutr 89 (6): 777-86 (2003)

Hazardous Substances Data Bank (HSDB)

Dietary nitrate is reduced to nitrite by some oral bacteria and the resulting nitrite is converted to nitric oxide (NO) in acidic gastric juice. The aim of this study is to elucidate the pathophysiological role of dietary nitrate in the stomach. Intragastric administration of nitrate rapidly increased nitrate and NO in plasma and the gastric headspace, respectively. Water-immersion-restraint stress (WIRS) increased myeloperoxidase (MPO) activity in gastric mucosa and induced hemorrhagic erosions by a nitrate-inhibitable mechanism. In animals that had received either cardiac ligation or oral treatment with povidone-iodine, a potent bactericidal agent, administration of nitrate failed to increase gastric levels of NO and to inhibit WIRS-induced mucosal injury. WIRS decreased gastric mucosal blood flow by a mechanism which was inhibited by administration of nitrate. These data suggested that the enterosalivary cycle of nitrate and related metabolites consisted of gastrointestinal absorption and salivary secretion of nitrate, its conversion to nitrite by oral bacteria and then to NO in the stomach might play important roles in the protection of gastric mucosa from hazardous stress. /Nitrates/

PMID:12653221
Miyoshi M et al; Free Radic Res 37 (1): 85-90 (2003)

Hazardous Substances Data Bank (HSDB)

Desensitization of hypersensitive teeth by the combination of dimethyl isosorbide (DMI) and potassium nitrate (potassium nitrate) is more effective than when potassium nitrate is used alone. potassium nitrate/DMI work together to desensitize hypersensitive teeth at a higher, quicker, and more profound and lasting level.

PMID:12017799
Hodosh M; Gen Dent 49 (5): 531-6 (2001)

Hazardous Substances Data Bank (HSDB)

The intestinal transport of D-xylose was studied during subchronic poisoning of male Wistar rats with the oral administration of potassium nitrate and sodium nitrite. The metabolic parameters of small intestine mucosa were determined one hour after xylose administration, i.e., Na+/K(+)-ATPase, alkaline phosphatase, oxygen consumption, and lactic acid level. Nitrite reduced the absorption of xylose and decreased the activity of Na+/K(+)-ATPase and alkaline phosphatase. No effect of sodium nitrite was demonstrated on the aerobic metabolism of intestinal mucosa with an increased lactic acid level. Potassium nitrate did not effect the processes of intestinal absorption of xylose nor the metabolic parameters of small intestine mucosa.

PMID:1659332
Grudzinski I, Szymanski A; Arch Environ Contam Toxicol 21 (3): 447-52 (1991)

Hazardous Substances Data Bank (HSDB)

For more Interactions (Complete) data for POTASSIUM NITRATE (7 total), please visit the HSDB record page.

Hazardous Substances Data Bank (HSDB)

13.1.9 Toxicity Summary

Acute oral toxicity (LD50): 1901 mg/kg in rabbits [MSDS] and 3750 mg/kg in rats [L1736]. The primary acute toxic effect of nitrates is the development of methemoglobinemia, a condition in which greater than 10% of the hemoglobin in the body is transformed into methemoglobin. When this conversion exceeds 70% the condition may result in death [L1750]. The potassium ion by itself possesses very little toxicity; the toxicity of the salts is associated with the anion. Potassium nitrate is rapidly absorbed from the upper gastrointestinal tract and is excreted mostly as the unchanged drug [L1736]. This excludes a small percentage of the ingested dose that is reduced by the microbial action of the gut to nitrite. Nitrites convert the hemoglobin in red blood cells into methemoglobin [L1736]. In male rats given potassium nitrate, intestinal absorption was affected [A32165]. Adverse increased potassium intake included changes in blood lipids, triglyceride, decreased high-density lipoprotein [HDL] cholesterol), changes in renal function, and increases in catecholamine levels. The decrease in blood volume caused by increased potassium activates the sympathetic nervous system, resulting in the release of adrenaline and noradrenaline. Decreases in blood volume may also contribute to the observed changes in blood lipid concentrations [L1755]. Death and severe effects of nitrate ingestion are generally associated with doses of the drugs above 10g NO3-. Doses ranging from 2-9 g NO3- have been reported to cause methemoglobinemia. These values correspond to 33 - 150 mg NO3-/kg [L1750] Potassium nitrate was shown to cause low to moderate acute toxicity. Repeated dose toxicity was investigated in rats given oral doses in the range 10-100 mg/kg per day for 4 months; bronchopneumonia, local hemorrhages, and other circulatory disorders were observed in treated animals. Cattle were given oral doses of 345-450 mg/kg daily (expressed as nitrate) for several months; blood phosphate and magnesium were decreased and blood calcium, urinary magnesium, urea and milk urea were increased [L1736].

DrugBank

13.1.10 Antidote and Emergency Treatment

Maintain an open airway and assist ventilation if necessary. Administer supplemental oxygen. Treat hypotension with supine positioning, intravenous crystalloid fluids, and a low dose -pressor if needed. Monitor vital signs and ECG for 4 to 6 hours. Symptomatic methemoglobinemia may be treated with methylene blue. ... Administer activated charcoal. Gastric emptying is not necessary for small ingestions if activated charcoal can be given promptly . Hemodialysis and hemoperfusion are not effective. Severe methemoglobinemia in infants not responsive to methylene blue therapy may require exchange transfusion. /Nitrates and Nitrites/

Olson, K.R. (Ed.); Poisoning & Drug Overdose. 4th ed. Lange Medical Books/McGraw-Hill. New York, N.Y. 2004., p. 279

Hazardous Substances Data Bank (HSDB)

Decontamination: Remove victim from exposure and administer supplemental oxygen if available. Remove contaminated clothing and wash with copious soap and water. Irrigate exposed eyes with water or saline. /Nitrates and NItrites/

Olson, K.R. (Ed.); Poisoning & Drug Overdose. 4th ed. Lange Medical Books/McGraw-Hill. New York, N.Y. 2004., p. 280

Hazardous Substances Data Bank (HSDB)

Basic treatment: Establish a patent airway (oropharyngeal or nasopharyngeal airway, if needed). Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for shock and treat if necessary ... Anticipate seizures and treat as necessary ... For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with 0.9% saline (NS) during transport ... Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 d of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal ... /Nitrates, nitrites, and related compounds/

Currance, P.L. Clements, B., Bronstein, A.C. (Eds).; Emergency Care For Hazardous Materials Exposure. 3Rd edition, Elsevier Mosby, St. Louis, MO 2005, p. 286-7

Hazardous Substances Data Bank (HSDB)

Advanced treatment: Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious or is in severe respiratory distress. Monitor cardiac rhythm and treat arrhythmias if necessary. Start IV administration of D5W /SRP: "To keep open", minimal flow rate/. Use 0.9% saline (NS) or lactated Ringer's (LR) if signs of hypovolemia are present. For hypotension with signs of hypovolemia, administer fluid cautiously. If unresponsive to these measures, vasopressors may be helpful. Watch for signs of fluid overload ... Treat seizures with diazepam or lorazepam ... Administer 1% solution methylene blue if patient is symptomatic with severe hypoxia, cyanosis, and cardiac compromise not responding to oxygen. DIRECT PHYSICIAN ORDER ONLY ... Use proparacaine hydrochloride to assist eye irrigation ... /Nitrates, nitrites, and related compounds/

Currance, P.L. Clements, B., Bronstein, A.C. (Eds).; Emergency Care For Hazardous Materials Exposure. 3Rd edition, Elsevier Mosby, St. Louis, MO 2005, p. 287

Hazardous Substances Data Bank (HSDB)

Remove contaminated clothes. Rinse and then wash /exposed/ skin with water and soap ... Rinse /exposed eyes/ with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.

IPCS, CEC; International Chemical Safety Card on Potassium nitrate. (October 2001). Available from, as of October 23, 2006: http://www.inchem.org/documents/icsc/icsc/eics0184.htm

Hazardous Substances Data Bank (HSDB)

Monitor vital signs, blood pressure, respiration and onset of cyanosis. Administer oxygen if there are clinical signs of methemoglobinaemia. Methylene blue is the specific antidote indicated in case of methaemoglobinemia. /Nitrate and nitrite poisoning/

IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm

Hazardous Substances Data Bank (HSDB)

... The treatment of methemoglobinemia caused by nitrates and nitrites is not specific: suppression of the oxidizing agents, oxygenation, prescription of reducing agents. /Nitrates and nitrites/

European Chemicals Bureau; IUCLID Dataset, Potassium nitrate (7757-79-1) (2000 CD-ROM edition). Available from, as of October 26, 2006: http://esis.jrc.ec.europa.eu/

Hazardous Substances Data Bank (HSDB)

... Relevant laboratory analyses are: arterial blood gases, acid base balance, nitrates could be measured in urine. The levels are usually below 150 mg NO3-/day). /Nitrate and nitrite poisoning/

IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm

Hazardous Substances Data Bank (HSDB)

Sample collection: Arterial blood sampling reveals a characteristic chocolate-brown color. Methemoglobin concentrations can be quantified by spectrophotometry and should be measured immediately. Biochemical analysis: Total hemoglobin, blood count. Serum electrolytes, especially potassium. Acid-base balance. Arterial blood gases. Urine analysis. Toxicological analysis: The most relevant investigation is methemoglobin concentration which correlates well with symptoms and should be monitored according to the clinical condition. /Nitrate and nitrite poisoning/

IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 25, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm

Hazardous Substances Data Bank (HSDB)

13.1.11 Medical Surveillance

Clinical Evaluation: History. Evaluation of a patient with suspected nitrate/nitrite exposure includes a complete medical history and physical examination. Clues to potential exposure are often obtained by reviewing the following items with the patient or family: location of home (urban, suburban, or rural); drinking water source and supply (if well water: depth, location, type of well construction, and frequency of microbiologic and nitrate testing); surrounding activities (agricultural or industrial) and proximity to drinking-water source; type of sewer system (municipal or septic) and proximity to drinking water source; recent flooding; occupations, avocations, and hobbies of family members; nutritional status (for infants: type of formula, feeding regimen, and source of dilution water); family history, including recent use of medications by infant and mother; and history of recent gastroenteritis with vomiting or diarrhea. /Nitrates and Nitrites/

ATSDR; Case Studies in Environmental Medicine. NITRATE/NITRITE TOXICITY. p 12. Course: SS3054. Revision Date: January 2001 Original Date: October 1991 Expiration Date: January 2007.

Hazardous Substances Data Bank (HSDB)

Physical examination should include special attention to the color of the skin and mucous membranes. If there is a history of gastroenteritis (especially in infants), evaluate the patient for the possible presence of dehydration (poor skin turgor, sunken fontanelle, dry mucous membranes). All cyanotic patients should be assessed for possible cardiac and lung disease (cardiac murmurs, gallops, arrhythmias; rales, rhonchi, wheezes, dullness or hyperresonance in the chest). A central chocolate-brown or slate-gray cyanosis that does not respond to administration of 100% oxygen is indicative of methemoglobinemia. Cyanosis due to cardiorespiratory compromise most often improves with administration of 100% oxygen. In young infants, look for labored breathing, respiratory exhaustion, hypotension, below-average weight gain, and failure to meet developmental markers. Gastroenteritis can increase the rates of production and absorption of nitrites in young infants and aggravate methemoglobinemia. /Nitrates and Nitrites/

ATSDR; Case Studies in Environmental Medicine. NITRATE/NITRITE TOXICITY. p 12. Course: SS3054. Revision Date: January 2001 Original Date: October 1991 Expiration Date: January 2007.

Hazardous Substances Data Bank (HSDB)

Signs and Symptoms Signs and symptoms of methemoglobinemia can be directly correlated with the percentage of total hemoglobin in the oxidized form... The lips and mucous membranes of patients with nitrate/nitrite toxicity usually have more of a brownish than a bluish cast. Dyspnea, especially on exertion, is common. Varying degrees of central nervous system depression might be present. The cardiac and pulmonary examinations are usually normal, but systolic flow murmurs might be detected. Cardiac arrhythmias and hypotension can occur in patients with severe poisoning, although death from methemoglobinemia alone is uncommon, except in infants. /Nitrates and Nitrites/

ATSDR; Case Studies in Environmental Medicine. NITRATE/NITRITE TOXICITY. p 13. Course: SS3054. Revision Date: January 2001 Original Date: October 1991 Expiration Date: January 2007.

Hazardous Substances Data Bank (HSDB)

Laboratory Evaluation Most commonly, a drop of the patient's blood is placed on a piece of filter paper next to a drop of blood from person who does not have methemoglobinemia; when dry, the blood with methemoglobin will turn a deep chocolate-brown or slate-gray color. A tube of methemoglobin containing blood will not turn red when shaken in air or when oxygen is bubbled through it, whereas blood that is dark because of normal deoxyhemoglobin will turn red. Screening Tests: Examination of blood color. Determination of the calculated versus measured arterial saturation gap. Hemoglobin and hematocrit. Serum-free hemoglobin (for hemolysis detection). Serum haptoglobin (for hemolysis detection). Heinz bodies on peripheral blood smear. Urinalysis. Specialized Tests: Determination of methemoglobin level. Tests for causes of congenital methemoglobinemia. Hemoglobin electrophoresis. Activity of NADH-dependent methemoglobin reductase. Tests for Causes of Failure of Methylene Blue Therapy (see Treatment and Management section): Activity of glucose-6-phosphate dehydrogenase (G-6-PD). Activity of NADPH-dependent methemoglobin reductase. Sulfhemoglobin blood level (not readily available for clinical use). /Nitrates and Nitrites/

ATSDR; Case Studies in Environmental Medicine. NITRATE/NITRITE TOXICITY. p 13-14. Course: SS3054. Revision Date: January 2001 Original Date: October 1991 Expiration Date: January 2007.

Hazardous Substances Data Bank (HSDB)

Direct Biologic Indicators. Although 80% to 90% of the body's excretion of **nitrate** is through urine and saliva, biologic **nitrate** or **nitrite** levels are generally not useful for diagnostic purposes. However, urinary and salivary **nitrate** concentrations can be important indicators of exposure requiring remedial action. The correlation between blood **nitrite** and methemoglobin is not usually linear at lower **nitrite** concentrations because a certain minimum amount of **nitrite** must enter the bloodstream before a measurable increase in methemoglobin concentration can be detected. /Nitrates and Nitrites/

ATSDR; Case Studies in Environmental Medicine. NITRATE/NITRITE TOXICITY. p 14. Course: SS3054. Revision Date: January 2001 Original Date: October 1991 Expiration Date: January 2007.

Hazardous Substances Data Bank (HSDB)

Indirect Biologic Indicators. The methemoglobin level in blood is the most useful screening, as well as diagnostic, test for **nitrate** toxicity. Methemoglobin can be measured in whole blood using a visible spectrophotometer (or co-oximeter) at 635 nanometers. To express the methemoglobin level as a percentage, total hemoglobin content of the blood sample also must be determined. Oximeters used to measure methemoglobin levels can falsely report sulfhemoglobin as methemoglobin. Although sulfhemoglobinemia is seldom severe enough to be life-threatening, its presence can explain some **methylene blue** treatment (see Treatment and Management section) failures. For the evaluation of suspected congenital methemoglobinemia, hemoglobin electrophoresis is helpful. In patients with methemoglobinemia, the partial pressure of **oxygen** (PO2) is usually normal despite the presence of an abnormal hemoglobin that cannot bind or transport **oxygen**. The percent O2 saturation calculated by some blood-gas instruments from the PO2, or calculated manually with a nomogram, will be normal. However, the percent O2 saturation actually measured with a co-oximeter will be decreased, resulting in a calculated versus measured arterial "percent O2 saturation gap." This finding is not specific for methemoglobinemia, however, because carboxyhemoglobinemia and sulfhemoglobinemia produce the same findings. Percent O2 saturation determined with a pulse oximeter might be unreliable in patients with methemoglobinemia, especially after administration of **methylene blue** (see Treatment and Management section). Arterial blood gases should be used to monitor oxygenation in such patients. /Nitrates and Nitrites/

ATSDR; Case Studies in Environmental Medicine. NITRATE/NITRITE TOXICITY. p 14-15. Course: SS3054. Revision Date: January 2001 Original Date: October 1991 Expiration Date: January 2007.

Hazardous Substances Data Bank (HSDB)

Treatment and Management In cases of mild **nitrate** toxicity (blood methemoglobin levels <20%), asymptomatic patients do not require treatment other than avoiding ingestion or inhalation of substances that cause methemoglobinemia. In symptomatic patients with moderate or severe toxicity and hypoxia or dyspnea, 100% oxygen should be administered immediately to saturate fully all remaining normal hemoglobin. Specific therapy for methemoglobinemia consists of intravenous administration of methylene blue at a dose of 1 to 2 milligrams/kilograms (mg/kg) body weight (0.1 to 0.2 milliliters [mL]/kg body weight of a 1% solution in saline) over a 5- to 10-minute period. Within 15 minutes of methylene blue administration, cyanosis will usually begin obviously to improve. If no response to the initial injection occurs within 15 minutes in seriously ill patients, or within 30 to 60 minutes in moderately ill patients, a second methylene blue dose of 0.1 mL/kg body weight can be given. Caution is advised because methylene blue can slightly worsen methemoglobinemia when given in excessive amounts. In general, the total dose administered during the first 2 to 3 hours should not be >0.5 to 0.7 mL/kg of body weight. **Methylene blue** should not be administered to a patient with known G-6-PD deficiency because severe hemolytic anemia can develop. For severe, life-threatening methemoglobinemia, especially when the patient responds poorly to **methylene blue** therapy or when the patient has G-6-PD deficiency, treatment options include exchange transfusion and hyperbaric **oxygen** therapy. During treatment in the hyperbaric chamber, sufficient **oxygen** can be dissolved directly in the blood to support life; reversible binding to hemoglobin is not required. Blood transfusion might be required if massive hemolysis develops. In persons with severe hemolysis, maintaining a brisk urine flow and alkalinizing the urine by administration of **sodium bicarbonate** might help protect against renal injury from erythrocyte breakdown products. Patients with severe poisoning who are experiencing seizures or cardiac arrhythmias might require anticonvulsant or antiarrhythmic therapy. If a local anesthetic is suspected of being the etiologic agent for the methemoglobinemia, however, **lidocaine** probably should be avoided. /Nitrates and Nitrites/

ATSDR; Case Studies in Environmental Medicine. NITRATE/NITRITE TOXICITY. p 15-16. Course: SS3054. Revision Date: January 2001 Original Date: October 1991 Expiration Date: January 2007.

Hazardous Substances Data Bank (HSDB)

13.1.12 Human Toxicity Excerpts

/HUMAN EXPOSURE STUDIES/ Death and severe effects of **nitrate** ingestion are generally associated with doses above 10 g NO3-. Doses between 2 and 9 g NO3- have been reported to cause methemoglobinemia. These values correspond to 33 to 150 mg NO3-/kg. /**Nitrate**/[IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm]

Hazardous Substances Data Bank (HSDB)

/SIGNS AND SYMPTOMS/ The major acute toxic effect from /**nitrate** and/ **nitrite** is development of methemoglobinemia, a condition where more than 10% of the hemoglobin is transformed into methemoglobin. When the conversion exceeds 70% the condition can be fatal ... These effects are reversible. The major concern of possible long-term effects of exposure to **nitrate** and **nitrite** is associated with formation of nitroso compounds, many of which are carcinogenic. This formation may take place wherever **nitrite** and nitrosable compounds are present, but it is favored by acidic conditions or the presence of some bacteria. The gastrointestinal tract and especially the stomach is regarded as the main formation site, but nitrosation reactions can also take place in an infected urinary bladder ... /**Nitrate** and **nitrite** poisoning/[IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm]

Hazardous Substances Data Bank (HSDB)

/SIGNS AND SYMPTOMS/ Ingestion of large quantities may cause violent gastroenteritis. Prolonged exposure to small amounts may produce anemia, methemoglobinemia, nephritis.[The Merck Index. 10th ed. Rahway, New Jersey: Merck Co., Inc., 1983., p. 1102]

Hazardous Substances Data Bank (HSDB)

/SIGNS AND SYMPTOMS/ ... Potassium nitrate ... /is/ rapidly absorbed and excreted unchanged, causing few reactions other than diuresis and perhaps catharsis. Under some circumstances, however, appreciable amounts of **nitrate** are converted to **nitrite**.[Gosselin, R.E., R.P. Smith, H.C. Hodge. Clinical Toxicology of Commercial Products. 5th ed. Baltimore: Williams and Wilkins, 1984., p. III-316]

Hazardous Substances Data Bank (HSDB)

For more Human Toxicity Excerpts (Complete) data for POTASSIUM NITRATE (28 total), please visit the **HSDB record page**.

Hazardous Substances Data Bank (HSDB)

13.1.13 Non-Human Toxicity Excerpts

/LABORATORY ANIMALS: Acute Exposure/ ... KNO3 was given in large quantities (1.0 to 1.2 g/kg) to goats to study the in vivo mechanism of acute **nitrate** poisoning. 1. The fatal dose of orally admin estimated to be 1.0 to 1.5 g/kg. The mean time for death to occur after the admin was 14 hr 4 min. This was not dose related. 2. MHb gradually incr after the admin in all, and in the dead ones it reached a max just before death, 62.6 + or - 9.9%. In the survived goats, MHb gradually incr after admin, reached a max, and then gradually decr and disappeared. However, it varied greatly individually. 3. NO3 in the rumen juice showed a max value in the first admin after admin of KNO3. It was 560 to 3847 ppm. Higher levels were detected in the groups receiving larger doses. And then, part of NO3 was reduced in the rumen juice to NO2. It incr slightly preceding MHb. In the dead animals it reached a max (190.3 + or - 82.5 ppm) just before death. It was noted that the influence of **ammonia** poisoning had to be considered in goats among the above-described NH3-N in which more that 50 mg/dL was detected. NO3 and NO2 quickly absorbed into the blood and excreted into the urine. Many of the goats maintained high levels of NO3 during the experiment. The behavior of NO2 in the blood and urine varied in parallel with MHb, though the amt detected

was very small, ie the max was 18.6 ppm. 4. The blood oxygen pressure showed a very high negative correlation with MHb. In the dead goats the NO2 declined following the incr of MHb showing minimum level (12.8 + or - 3.4 ppm) just before death. Main cause of death by acute nitrate poisoning is concluded to be oxygen shortage.[European Chemicals Bureau; IUCLID Dataset, Potassium nitrate (7757-79-1) (2000 CD-ROM edition). Available from, as of October 25, 2006: http://esis.jrc.ec.europa.eu/]

Hazardous Substances Data Bank (HSDB)

/LABORATORY ANIMALS: Acute Exposure/ In experimental horses, an oral dose of 1000 mg/kg of body wt of potassium nitrate caused illness but not death. Nitrate has been associated with the death of horses under field conditions ... The acute oral lethal dose of potassium nitrate is 1000 mg/kg /in sheep/.[Booth, N.H., L.E. McDonald (eds.). Veterinary Pharmacology and Therapeutics. 5th ed. Ames, Iowa: Iowa State University Press, 1982., p. 944]

Hazardous Substances Data Bank (HSDB)

/LABORATORY ANIMALS: Acute Exposure/ LD100 /acute lethal oral doses are:/ 541 to 1010 mg/kg /for/ cattle ... 1000 to 1500 mg/kg /for/ goats ... 2000 mg/kg /for/ chicken ... 505 mg/kg /for/ sheep ...[European Chemicals Bureau; IUCLID Dataset, Potassium nitrate (7757-79-1) (2000 CD-ROM edition). Available from, as of October 25, 2006: http://esis.jrc.ec.europa.eu/]

Hazardous Substances Data Bank (HSDB)

/LABORATORY ANIMALS: Subchronic or Prechronic Exposure/ ... The study was to investigate the effect of dietary nitrate exposure on the thyroid status along with the state of iodine nutrition. Rats were fed diet containing 3% potassium nitrate (KNO3) for 4 weeks and then thyroid status was evaluated by thyroid gland weight, urinary iodine excretion pattern, thyroid peroxidase (TPO) activity, serum levels of total thyroxine (T4), triiodothyronine (T3) and thyroid stimulating hormone (TSH) concentrations. In nitrate treated animals, the weight of thyroid gland was increased significantly ($P<0.001$) while thyroid peroxidase activity ($P<0.01$), serum T4 ($P<0.01$) and serum T3 levels ($P<0.001$) were reduced; but serum TSH level was increased ($P<0.001$) along with slightly elevated iodine excretion level ($P<0.001$) in comparison to control animals. The overall results indicated the development of a relative state of functional hypothyroidism with enlarged thyroid after nitrate exposure. This study can explain a part for the persistence of residual goitre in the post-salt iodization phase.[Mukhopadhyay S et al; Indian J Physiol Pharmacol 49(3): 284-8 (2005)]
PMID:16440845

Hazardous Substances Data Bank (HSDB)

For more Non-Human Toxicity Excerpts (Complete) data for POTASSIUM NITRATE (23 total), please visit the HSDB record page.

Hazardous Substances Data Bank (HSDB)

13.1.14 Human Toxicity Values

The lethal dose of potassium nitrate for an adult ranges from 54 to 462 mg/kg.

Burden EHWJ; Analyst 86: 429-33 (1961) as cited in Health Advisories for Legionella and Seven Inorganics p.98 (1987) PB87-235586

Hazardous Substances Data Bank (HSDB)

13.1.15 Non-Human Toxicity Values

LD50 Rabbit oral 1901 mg/kg

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 3036

Hazardous Substances Data Bank (HSDB)

LD50 Rat oral 3750 mg/kg

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 3036

Hazardous Substances Data Bank (HSDB)

LD50 Rabbit oral 1.166 g anion/kg /Nitrate ion/

The Merck Index. 10th ed. Rahway, New Jersey: Merck Co., Inc., 1983., p. 1102

Hazardous Substances Data Bank (HSDB)

LD50 Rat oral 3015 mg/kg

European Chemicals Bureau; IUCLID Dataset, Potassium nitrate (7757-79-1) (2000 CD-ROM edition). Available from, as of October 25, 2006: http://esis.jrc.ec.europa.eu/

Hazardous Substances Data Bank (HSDB)

13.1.16 Ecotoxicity Values

Showing 5 of 14 View More

LC50; Species: Daphnia magna (Water flea); Conditions: freshwater; static; Concentration: 900 mg/L for 4.2 days /total/

Dowden BF, Bennett HJ; J Water Pollut Control Fed 37 (9): 1308-1316 (1965) Available from, as of August 28, 2006

Hazardous Substances Data Bank (HSDB)

LC50; Species: Daphnia magna (Water flea); Conditions: freshwater; static; Concentration: 490 mg/L for 24 hr /total/

Dowden BF, Bennett HJ; J Water Pollut Control Fed 37 (9): 1308-1316 (1965) Available from, as of August 28, 2006

Hazardous Substances Data Bank (HSDB)

LC50; Species: Daphnia magna (Water flea); Conditions: freshwater; static; Concentration: 490 mg/L for 48 hr /total/

Dowden BF, Bennett HJ; J Water Pollut Control Fed 37 (9): 1308-1316 (1965) Available from, as of August 28, 2006

Hazardous Substances Data Bank (HSDB)

LC50; Species: Daphnia magna (Water flea); Conditions: freshwater; static; Concentration: 226 mg/L for 72 hr /total/

Dowden BF, Bennett HJ; J Water Pollut Control Fed 37 (9): 1308-1316 (1965) Available from, as of August 28, 2006

Hazardous Substances Data Bank (HSDB)

LC50; Species: Daphnia magna (Water flea); Conditions: freshwater; static; Concentration: 39 mg/L for 96 hr /total/

Dowden BF, Bennett HJ; J Water Pollut Control Fed 37 (9): 1308-1316 (1965) Available from, as of August 28, 2006

Hazardous Substances Data Bank (HSDB)

13.1.17 Ecotoxicity Excerpts

/BIRDS and MAMMALS/ The intended purpose of /pesticide/ products containing these active ingredients is to kill certain vertebrates and wasp pest species inhabiting burrows. ... Application is subsurface and precludes exposure to avian populations and aquatic organisms. The Agency realizes, however, that any organism in a properly treated burrow will likely be killed and is concerned about potential impact to populations of non-target and endangered species. The open literature indicates that several types of non-target organisms, including burrowing owls, may inhabit the burrows of target pests. ... Due to the potential risk to non-target organisms, the Agency is currently developing more extensive labeling regarding timing of application and observation of signs indicating the presence or absence of target and nontarget organisms. These instructions will be explicit concerning actions users must take before applying the product. The use of these products may also result in a potential impact on endangered species which utilize burrows...

USEPA/Office of Pesticide Programs; Reregistration Eligibility Decision Document - Inorganic Nitrate/Nitrite (Sodium and Potassium Nitrates), September 1991. Available from, as of October 11, 2006: http://www.epa.gov/pesticides/reregistration/status.htm

Hazardous Substances Data Bank (HSDB)

/AQUATIC SPECIES/ /Reproduction rate (numbers of Hydra at a given time) of Hydra attenuata is recorded in control soln and in soln containing 50, 150, 250 mg NO3/L (81.5, 245, 408 mg KNO3/L)/. At 50 mg NO3/L (81.5 mg KNO3/L) and 150 mg NO3/L (245 mg KNO3/L) the growth rate was similar or slightly superior to that of the controls. At 250 mg NO3/L (408 mg KNO3/L) the rate of growth was considerably retarded, but clubbing of tentacles was not observed. Potassium nitrate was found to be the least toxic of the 3 nitrates (KNO3, NaNO3, NH4NO3) tested with a no-effect level of between 150 and 250 mg NO3/L (between 245 and 408 mg KNO3/L). The cation had a considerable influence on toxicity of nitrate soln.

European Chemicals Bureau; IUCLID Dataset, Potassium nitrate (7757-79-1) (2000 CD-ROM edition). Available from, as of October 25, 2006: http://esis.jrc.ec.europa.eu/

Hazardous Substances Data Bank (HSDB)

/AQUATIC SPECIES/ /In a/ static /assay,/ ... in soln with a potassium nitrate concn up to 1,035 mg potassium nitrate/L the development of loach (Misgurnus fossilis) /embryos/ up to resorption of the yolk sac was similar to the controls. At 2,068 to 2,586 mg potassium nitrate/L prolarvae hatched but then died. Starting at a concn of 5,171 mg potassium nitrate/L or more no development occurred.

European Chemicals Bureau; IUCLID Dataset, Potassium nitrate (7757-79-1) (2000 CD-ROM edition). Available from, as of October 25, 2006: http://esis.jrc.ec.europa.eu/

Hazardous Substances Data Bank (HSDB)

/AQUATIC SPECIES/ Chronic toxicity of potassium nitrate due to a slight incr of KNO3 (8.5 mg K/L or 22 mg KNO3/L) was studied /in Tinca tinca (tench)/ over an exposure period of 2 to 35 days /in a/ flow-through /system/. The effect on blood and tissue parameters such as: plasma glycose, free plasma fatty acids, plasma glycerol, serum lactic acid, amino acids of whole blood and of plasma and of plasma cortisol was studied. Further Na and K were assayed in whole blood, plasma and liver, water content in liver and in muscle was determined together with glycogen levels in the heart, the liver and the muscles ... When Tinca tinca was exposed to a slight incr in the potassium content of the water (from 1.5 mg K/L to 8.5 mg K/L) metabolic and hormonal changes occurred which lasted more than 4 wk. An initial phase of lipolysis was followed by as partial consumption of glycogen reserves, which in turn was followed by a phase of glyconeogenesis. Hypoglycemia persisted through the experiment. The ion distribution in erythrocytes and liver changed relative early, there was no observable change in water content. These changes are similar to those observed during osmoregulation of fish.

European Chemicals Bureau; IUCLID Dataset, Potassium nitrate (7757-79-1) (2000 CD-ROM edition). Available from, as of October 25, 2006: http://esis.jrc.ec.europa.eu/

Hazardous Substances Data Bank (HSDB)

13.1.18 Populations at Special Risk

A small percentage of adults are at greater risk than most and these include pregnant women with an enzyme deficiency (glucose-phosphate dehydrogenase), and adults with a hereditary deficiency in methemoglobin reductase.

Wetzlich S; II Nitrates. Cooperative Extension University of California Environmental Toxicology Newsletter. 11(1). (March 1991)

Hazardous Substances Data Bank (HSDB)

Neonates are at special risk for high nitrate and nitrite levels as their enzyme system for regeneration of hemoglobin is not fully developed ... Most clinical case data refers to neonates developing methemoglobinemia after drinking water or water-based formulations with high nitrate or nitrite content. The great majority of cases (well-water methemoglobinemia) occurred when nitrate levels in drinking water exceeded 100 mg NO3-/L ... It is generally acknowledged that water nitrate content of 50 mg/L is safe even for neonates. Assuming normal liquid intake of 150 mL/kg/day by neonates, nitrate intake of 7.5 mg NO3-/kg/day is safe ... Cases of methemoglobinemia have also been reported due to feeding babies vegetable preparations where nitrate has been converted to nitrite through bacterial action. /Nitrate and nitrite poisoning/

IPCS; Poisons Information Monograph G016: Nitrates and nitrites. (September 1996). Available from, as of October 24, 2006: http://www.inchem.org/documents/pims/chemical/pimg016.htm

Hazardous Substances Data Bank (HSDB)

... Individuals with stomach lesions or disorders ... /and/ persons on cimetidine and other antacid medication present special risk groups in which a correlation between nitrate or nitrite intake and incidence of gastric cancer cannot be excluded. /Nitrate and nitrite/

European Chemicals Bureau; IUCLID Dataset, Sodium nitrite (7632-00-0) (2000 CD-ROM edition). Available from, as of October 27, 2006: http://esis.jrc.ec.europa.eu/

Hazardous Substances Data Bank (HSDB)

Aside from infants under 3 months of age, several other categories of individuals with altered physiological status or with hereditary or acquired disease may also be predisposed to the development of nitrite- or nitrate-induced methemoglobinemia. These include pregnant women ... individuals with glucose-6-phosphate dehydrogenase deficiency ... adults with reduced gastric acidity (including those being treated for peptic ulcer or individuals with chronic gastritis or pernicious anemia), a rare group with a hereditary lack of NADH or methemoglobin reductase activity in their red blood cells ... and probably the elderly ... Individuals with hereditary structural abnormalities in hemoglobin, referred to as hemoglobin Ms, are probably also at increased risk from dietary nitrate or nitrite. /Nitrate and nitrite/

WHO; WHO Food Additives Series 35: Nitrite (844). Available from, as of October 30, 2006: http://www.inchem.org/documents/jecfa/jecmono/v35je13.htm

Hazardous Substances Data Bank (HSDB)

Atrophic gastritis is a relevant factor in determining the gastric nitrite level, because nitrate administered to subjects with this type of gastritis results in a ten times higher nitrite concentration than that found in subjects with a normal mucosa. A given nitrate dose may be harmless to normal subjects, but harmful to a patient with atrophic gastritis, especially in the presence of precursors of N-nitrosamines or nitrosamides in the diet. /Nitrate and nitrite/

WHO; WHO Food Additives Series 35 (844): Nitrite. Available from, as of October 31, 2006: http://www.inchem.org/documents/jecfa/jecmono/v35je13.htm

Hazardous Substances Data Bank (HSDB)

... Iron deficient patients with gastric lesions and patients with pernicious anemia (PA) are predisposed to stomach cancer and also have a high reduction rate of nitrate to nitrite. The reduction rates in PA patients were nearly 50-fold higher than of matched controls, as was the number of bacteria. /Nitrate and nitrite/

WHO; WHO Food Additives Series 35 (844): Nitrite. Available from, as of October 31, 2006: http://www.inchem.org/documents/jecfa/jecmono/v35je13.htm

Hazardous Substances Data Bank (HSDB)

13.2 Ecological Information

13.2.1 Artificial Pollution Sources

... potassium nitrate ... /is/ present in well water contaminated by runoff from nitrogen fertilizers, decaying matter, or sewage treatment plants.

Ellenhorn, M.J. and D.G. Barceloux. Medical Toxicology - Diagnosis and Treatment of Human Poisoning. New York, NY: Elsevier Science Publishing Co., Inc. 1988., p. 844

Hazardous Substances Data Bank (HSDB)

14 Literature

14.1 Coronavirus Studies

PubChem

14.2 NLM Curated PubMed Citations

PubChem

14.3 Springer Nature References

Springer Nature

14.4 Thieme References

Thieme Chemistry

14.5 Wiley References

Wiley

14.6 Depositor Provided PubMed Citations

PubChem

14.7 Synthesis References

https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/potassium-nitrate

DrugBank

14.8 General References

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3. Schultz DS, Deen WM, Karel SF, Wagner DA, Tannenbaum SR: Pharmacokinetics of nitrate in humans: role of gastrointestinal absorption and metabolism. Carcinogenesis. 1985 Jun;6(6):847-52. [PMID:3159503]
4. Bychkov R, Gollasch M, Steinke T, Ried C, Luft FC, Haller H: Calcium-activated potassium channels and nitrate-induced vasodilation in human coronary arteries. J Pharmacol Exp Ther. 1998 Apr;285(1):293-8. [PMID:9536024]
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6. Potassium Nitrate
7. COMMITTEE FOR VETERINARY MEDICINAL PRODUCTS
8. CHEBI:63043 - potassium nitrate
9. POTASSIUM NITRATE
10. Mechanism of Action of a Desensitizing Fluoride Toothpaste Delivering Calcium and Phosphate Ingredients in the Treatment of Dental Hypersensitivity
11. EPA NITRATES DOCUMENT
12. Nitrates
13. Potassium Nitrate
14. NITRATE
15. Guideline-Potassium Intake
16. Nitrates in the meat industry

17. POTASSIUM CHLORIDE
18. Reduction in Dental Hypersensitivity with Nano-Hydroxyapatite, Potassium Nitrate, Sodium Monoflurophosphate and Antioxidants
19. Dietary nitrite and nitrate: a review of potential mechanisms of cardiovascular benefits
20. DailyMed: Dr. Sheffield Sensitive Care (potassium nitrate 5%)

▶ DrugBank

14.9 Chemical Co-Occurrences in Literature

▶ PubChem

14.10 Chemical-Gene Co-Occurrences in Literature

▶ PubChem

14.11 Chemical-Disease Co-Occurrences in Literature

▶ PubChem

15 Patents

15.1 Depositor-Supplied Patent Identifiers

PubChem

Link to all deposited patent identifiers

PubChem

15.2 WIPO PATENTSCOPE

Patents are available for this chemical structure:

https://patentscope.wipo.int/search/en/result.jsf?inchikey=FGIUAXJPYTZDNR-UHFFFAOYSA-N

PATENTSCOPE (WIPO)

16 Biomolecular Interactions and Pathways

16.1 Drug-Gene Interactions

Drug Gene Interaction database (DGIdb)

16.2 Chemical-Gene Interactions

16.2.1 CTD Chemical-Gene Interactions

Comparative Toxicogenomics Database (CTD)

16.3 DrugBank Interactions

DrugBank

16.4 Drug-Drug Interactions

DrugBank

17 Biological Test Results

17.1 BioAssay Results

PubChem

18 Classification

18.1 Ontologies

18.1.1 MeSH Tree

Medical Subject Headings (MeSH)

18.1.2 ChEBI Ontology

ChEBI

18.1.3 KEGG: Risk Category of Japanese OTC Drugs

KEGG

18.1.4 ChemIDplus

ChemIDplus

18.1.5 CAMEO Chemicals

CAMEO Chemicals

18.1.6 ChEMBL Target Tree

ChEMBL

18.1.7 UN GHS Classification

UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

18.1.8 EPA CPDat Classification

EPA Chemical and Products Database (CPDat)

18.1.9 NORMAN Suspect List Exchange Classification

NORMAN Suspect List Exchange

18.1.10 EPA DSSTox Classification

EPA DSSTox

19 Information Sources

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   ChemIDplus Chemical Information Classification
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   https://comptox.epa.gov/dashboard/chemical_lists/

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   Potassium nitrate
   https://echa.europa.eu/substance-information/-/substanceinfo/100.028.926

   Potassium nitrate
   https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/104170

7. **Hazardous Substances Data Bank (HSDB)**

   POTASSIUM NITRATE
   https://pubchem.ncbi.nlm.nih.gov/source/hsdb/1227

8. **ILO International Chemical Safety Cards (ICSC)**

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   https://www.ilo.org/dyn/icsc/showcard.display?p_version=2&p_card_id=0184

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   https://www.cdc.gov/Other/disclaimer.html

   Potassium nitrate
   https://www.cdc.gov/niosh-rtecs/TT387520.html

10. **EU Food Improvement Agents**

    POTASSIUM NITRATE
    https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32012R0231

11. **Wikipedia**

    potassium nitrate
    https://en.wikipedia.org/wiki/Potassium_nitrate

12. **DOT Emergency Response Guidebook**

    potassium nitrate
    https://www.phmsa.dot.gov/hazmat/erg/emergency-response-guidebook-erg

13. NJDOH RTK Hazardous Substance List

potassium nitrate
http://nj.gov/health/eoh/rtkweb/documents/fs/1574.pdf

14. ChEBI

Potassium nitrate
http://www.ebi.ac.uk/chebi/searchId.do?chebiId=CHEBI:63043

ChEBI Ontology
http://www.ebi.ac.uk/chebi/userManualForward.do#ChEBI%20Ontology

15. NCI Thesaurus (NCIt)

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Potassium Nitrate
https://ncit.nci.nih.gov/ncitbrowser/ConceptReport.jsp?dictionary=NCI_Thesaurus&ns=NCI_Thesaurus&code=C82074

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https://www.dgidb.org/drugs/POTASSIUM NITRATE

19. EPA Chemical and Products Database (CPDat)

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https://www.epa.gov/privacy/privacy-act-laws-policies-and-resources

potassium nitrate
https://comptox.epa.gov/dashboard/DTXSID4029692#exposure

EPA CPDat Classification
https://www.epa.gov/chemical-research/chemical-and-products-database-cpdat

20. Joint FAO/WHO Expert Committee on Food Additives (JECFA)

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https://apps.who.int/food-additives-contaminants-jecfa-database/chemical.aspx?chemID=710

21. NORMAN Suspect List Exchange

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NORMAN Suspect List Exchange Classification
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22. NITE-CMC

Potassium nitrate - FY2010
https://www.nite.go.jp/chem/english/ghs/10-mhlw-2021e.html

Potassium nitrate - FY2006
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23. FDA Center for Food Safety and Applied Nutrition (CFSAN)

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https://www.cfsanappsexternal.fda.gov/scripts/fdcc/index.cfm?set=FoodSubstances&id=POTASSIUMNITRATE

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RU45X2JN0Z
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25. Pistoia Alliance Chemical Safety Library

Decolorizing carbon; POTASSIUM NITRATE
http://www.pistoiaalliance.org/projects/chemical-safety-library/

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27. SpectraBase

POTASSIUM NITRATE
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POTASSIUM NITRATE
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NITRIC ACID, POTASSIUM SALT
https://spectrabase.com/spectrum/BtddvgnTteU

POTASSIUM NITRATE
https://spectrabase.com/spectrum/8Iod0TOISeB

potassium nitrate
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Potassium nitrate
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Potassium nitrate
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31. **Medical Subject Headings (MeSH)**

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32. **KEGG**

Risk category of Japanese OTC drugs
http://www.genome.jp/kegg-bin/get_htext?br08312.keg

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GHS Classification Tree
http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html

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35. **PATENTSCOPE (WIPO)**

SID 403031770
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