

Cerium(IV) Nitrate		Pricing >
Linear Formula	Ce(NO ₃) ₄	
Pubchem CID	166767	
MDL Number	MFCD00243270	
EC No.	236-007-2	
IUPAC Name	cerium(4+); tetranitrate	
Beilstein/Reaxys No.	N/A	
SMILES	[N+](=O)([O-])[O-].[N+](=O)([O-])[O-].[N+](=O)([O-])[O-].[N+](=O)([O-])[O-].[Ce+4]	
Inchi Identifier	InChI=1S/Ce.4NO3/c;4*2-1(3)4/q+4;4*-1	
Inchi Key	LQCIDLXXSFUYSA-UHFFFAOYSA-N	
Signal Word	Danger	
Hazard Statements	H272-H314	
Hazard Codes	O,Xi	
Risk Codes	N/A	
Safety Statements	N/A	
Transport Information	N/A	

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SAFETY DATA SHEET

Date Accessed: 04/29/2024

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SECTION 1. IDENTIFICATION

Product Identifiers: All applicable American Elements product codes for CAS #13093-17-9

Relevant identified uses of the substance:
Scientific research and development

Supplier details:
American Elements
10884 Weyburn Ave.
Los Angeles, CA 90024
Tel: +1 310-208-0551
Fax: +1 310-208-0351

Emergency telephone number:
Domestic, North America +1 800-424-9300
International +1 703-527-3887

SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification according to Regulation (EC) No

1272/2008

GHS03 flame over circle

Ox. Liq. 2

H272 May intensify fire; oxidiser.

GHS05 corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.

Other hazards that do not result in classification

No data available

Label elements

Labelling according to Regulation (EC) No 1272/2008

The substance is classified and labelled according to the CLP regulation.

Hazard pictograms



GHS03 GHS05

Signal word

Danger

Hazard statements

H272 May intensify fire; oxidiser.

H314 Causes severe skin burns and eye damage.

Precautionary statements

P221 Take any precaution to avoid mixing with combustibles.

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards

Results of PBT and vPvB assessment

PBT: N/A

vPvB: N/A

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances

(CAS#) Description:

Cerium (IV) nitrate (CAS# 13093-17-9); 28%

Water (CAS# 7732-18-5); 67%
Nitric acid (CAS# 7697-37-2); 5%

SECTION 4. FIRST AID MEASURES

Description of first aid measures General information

Immediately remove any clothing soiled by the product. If inhaled:

Supply patient with fresh air. If not breathing, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

In case of skin contact:

Immediately wash with soap and water; rinse thoroughly. Seek immediate medical advice.

In case of eye contact:

Rinse opened eye for several minutes under running water. Consult a physician. If swallowed:

Seek immediate medical advice.

SECTION 5. FIREFIGHTING MEASURES

Extinguishing media

Suitable extinguishing agents

Product is not flammable. Use fire fighting measures that suit the surrounding fire.

Special hazards arising from the substance or mixture

This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

Advice for firefighters

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Environmental precautions:

Do not allow material to be released to the environment without official permits.

Methods and materials for containment and cleanup:

Use neutralizing agent.

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

Absorb with liquid-binding material.
Reference to other sections
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7. HANDLING AND STORAGE

Handling

Precautions for safe handling

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

Information about protection against explosions and fires:

Substance/product can reduce the ignition temperature of flammable substances. This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

The product is not flammable

Conditions for safe storage, including any incompatibilities

Storage

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:

Store away from flammable substances.

Store away from reducing agents.

Aqueous solutions are incompatible with alkali and alkaline earth metals and many reactive organic and inorganic chemicals.

Further information about storage conditions:

Keep container tightly sealed.

Store in cool, dry conditions in well-sealed containers.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Additional information about design of technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

Components with limit values that require monitoring at the workplace:

Nitric acid

ppm

ACGIH TLV 2; 4-STEL

Austria MAK 2
Belgium TWA 2; 4-STEL
Denmark TWA 2
Finland TWA 2; 5-STEL (skin)
France VME 2; 5-VLE
Germany MAK 2
Hungary 5 mg/m³-STEL
Japan OEL 2
Korea TLV 2; 4-STEL
Norway TWA 2
Poland TWA 5 mg/m³; 10 mg/m³-STEL
Russia TWA 2; 2 mg/m³-STEL (skin)
Sweden NGV 2; 5-KTV
United Kingdom LTEL 2; 4-STEL
USA PEL 2
Additional information: No data
Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands: Impervious gloves
Eye protection:
Safety glasses
Tightly sealed goggles
Full face protection
Body protection: Protective work clothing.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties
Appearance:
Form: Solution
Color: Colorless
Odor: Odorless
Odor threshold: No data available.
pH: No data available.
Melting point/Melting range: No data available
Boiling point/Boiling range: No data available
Sublimation temperature / start: No data available
Flash point: N/A
No data available
Flammability (solid, gas) N/A
Ignition temperature: No data available
Decomposition temperature: No data available

Autoignition: No data available.
Explosion limits:
Lower: No data available
Upper: No data available
Vapor pressure: No data available
Density at 20°C (68 °F): 1.35 g/cm³ (11.266 lbs/gal)
Relative density No data available.
Vapor density No data available.
Evaporation rate No data available.
Solubility in / Miscibility with
Water: Fully miscible
Segregation coefficient (n-octanol/water): No data available.
Viscosity:
Dynamic: No data available.
Kinematic: No data available.
Other information No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity
Chemical stability
Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions
Reacts with alkali metals.
Reacts with reducing agents
Reacts with flammable substances
Reacts with alkaline earth metals.
Incompatible materials:
Aqueous solutions are incompatible with alkali and alkaline earth metals and many reactive organic and inorganic chemicals.
Hazardous decomposition products: Nitrogen oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects
Acute toxicity:
LD/LC50 values that are relevant for classification:
Oral: LDLo: 430 mg/kg (hmn)(HNO₃)
Unreported: LDLo: 110 mg/kg (man)(HNO₃)
Primary irritant effect:
on the skin: Corrosive effect on skin and mucous membranes.
on the eye: Strong corrosive effect.
Sensitization: No sensitizing effects known.
Subacute to chronic toxicity:

Nitric acid is a corrosive oxidizing acid. The liquid causes burns on contact. Eye contact may cause blindness. Vapors are irritating and cause upper respiratory irritation which may be severe. Corrosive to the teeth and digestive tract on ingestion. Dilute solutions have reduced effects.

Cerium salts increase the blood coagulation rate.

Exposure to cerium salts may increase sensitivity to heat, itching and skin lesions. Large doses to experimental animals have caused writhing, ataxia, labored respiration, sedation, hypotension and death by cardiovascular collapse.

Additional toxicological information:

Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity

Acquatic toxicity: No data available

Persistence and degradability No data available

Behavior in environmental systems:

Bioaccumulative potential No data available

Mobility in soil No data available

Additional ecological information:

Do not allow undiluted product or large quantities of it to reach groundwater, water courses, or sewage systems.

Do not allow material to be released to the environment without official permits.

Results of PBT and vPvB assessment

PBT: N/A

vPvB: N/A

Other adverse effects No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Recommendation Consult official regulations to ensure proper disposal.

Uncleaned packagings:

Recommendation: Disposal must be made according to official regulations.

Recommended cleansing agent: Water, if necessary

with cleansing agents.

SECTION 14. TRANSPORT INFORMATION

DOT regulations:

Hazard class: 5.1

Identification number: UN3218

Packing group: III

Proper shipping name (technical name): NITRATES,
INORGANIC, AQUEOUS SOLUTION, N.O.S.

Label 5.1

Land transport ADR/RID (cross-border)

ADR/RID class: 5.1 (O1) Oxidizing substances

Danger code (Kemler): 50

UN-Number: 3218

Packaging group: III

UN proper shipping name: 3218 NITRATES,
INORGANIC, AQUEOUS SOLUTION, N.O.S.
(cerium (IV) nitrate solution)

Maritime transport IMDG:

IMDG Class: 5.1

UN Number: 3218

Label 5.1

Packaging group: III

Marine pollutant: No

Proper shipping name: NITRATES, INORGANIC,
AQUEOUS SOLUTION, N.O.S.

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: 5.1

UN/ID Number: 3218

Label 5.1

Packaging group: III

Proper shipping name: NITRATES, INORGANIC,
AQUEOUS SOLUTION, N.O.S.

UN "Model Regulation": UN3218, NITRATES,
INORGANIC, AQUEOUS SOLUTION, N.O.S., 5.1, III

Special precautions for user Warning: Oxidizing
substances

Transport in bulk according to Annex II of
MARPOL73/78 and the IBC Code N/A

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental
regulations/legislation specific for the substance or
mixture

Product related hazard informations:

Hazard symbols:

C Corrosive

O Oxidizing

Risk phrases:

8 Contact with combustible material may cause fire.

34 Causes burns.

Safety phrases:

17 Keep away from combustible material.

26 In case of contact with eyes, rinse immediately with plenty of water and seek

medical advice.

36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

45 In case of accident or if you feel unwell, seek medical advice immediately.

National regulations

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

All components of this product are listed on the Canadian Non-Domestic Substances List (NDSL).

Information about limitation of use:

For use only by technically qualified individuals.

This product is subject to the reporting requirements of section 313 of the Emergency

Planning and Community Right to Know Act of 1986 and 40CFR372.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH). The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. American Elements shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. COPYRIGHT 1997-2022 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.

- Effects of cerium nitrate on the growth and physiological characteristics in *Cyclocarya paliurus* seedlings. Yinfeng XIE, Ying LI, Nana LIU, Yingying ZHANG, Xulan SHANG. *Journal of Rare Earths*, Volume 33, Issue 8, August 2015, Pages 898-904.
- Electrochemical techniques for practical evaluation of corrosion inhibitor effectiveness. Performance of cerium nitrate as corrosion inhibitor for AA2024T3 alloy. N. C. Rosero-Navarro, M. Curioni, R. Bingham, A. Durán, G. E. Thompson. *Corrosion Science*, Volume 52, Issue 10, October 2010, Pages 3356-3366.
- Enhancement of the corrosion resistance of zinc-aluminum-chromium coating with cerium nitrate. Ke-bing Zhang, Ming-ming Zhang, Jing-fei Qiao, Sheng-lin Zhang. *Journal of Alloys and Compounds*, Volume 692, 25 January 2017, Pages 460-464.
- 18-Crown-6 for the selective extraction and separation of cerium(IV) from nitrate medium containing some lanthanides. N. E. El-Hefny, Y. A. El-Nadi, I. M. Ahmed. *International Journal of Mineral Processing*, Volume 101, Issues 1–4, 23 November 2011, Pages 58-62.
- Self-healing active anticorrosion coatings with polyaniline/cerium nitrate hollow microspheres. Zhihua Li, Jiankang Hu, Yanbo Li, Feng Zheng, Jun Liu. *Surface and Coatings Technology*, Volume 341, 15 May 2018, Pages 64-70.
- Coordination and extraction studies of an unexplored bi-functional ligand, carbamoyl methyl pyrazole (CMPz) with uranium(VI), lanthanum(III) and cerium(III) nitrates. S. Kannan, J. S. Gamare, K. V. Chetty, M. G. B. Drew. *Polyhedron*, Volume 26, Issue 14, 31 August 2007, Pages 3810-3816.
- ZrO₂ sol–gel pre-treatments doped with cerium nitrate for the corrosion protection of AA6060. L. Paussa, N. C. Rosero Navarro, D. Bravin, F. Andreatta, L. Fedrizzi. *Progress in Organic Coatings*, Volume 74, Issue 2, June 2012, Pages 311-319.
- Toluene combustion on γ -Al₂O₃–CeO₂ catalysts prepared from boehmite and cerium nitrate. G. Del Angel, J. M. Padilla, I. Cuauhtémoc, J. Navarrete. *Journal of Molecular Catalysis A: Chemical*, Volume 281, Issues 1–2, 18 February 2008, Pages 173-178.
- Chitosan-based self-healing protective coatings doped with cerium nitrate for corrosion protection of aluminum alloy 2024. J. Carneiro, J. Tedim, S. C. M. Fernandes, C. S. R. Freire, M. L. Zheludkevich. *Progress in Organic Coatings*, Volume 75, Issues 1–2, September–October 2012, Pages 8-13.
- An electrochemical and superficial assessment of the corrosion behavior of AA 2024-T3 treated with metacryloxypropylmethoxysilane and cerium nitrate. S. M. Tamborim, A. P. Z. Maisonnave, D. S. Azambuja, G. E. Englert. *Surface and Coatings Technology*, Volume 202, Issue 24, 15 August 2008, Pages 5991-6001.
- Transient heat, mass and momentum transfer of an evaporating stationary droplet containing dissolved cerium nitrate in a rf thermal argon–oxygen plasma under reduced pressure. I. Castillo, R. J. Munz. *International Journal of Heat and Mass Transfer*, Volume 50, Issues 21–22, October 2007, Pages 4468-4487.
- Self-healing ability and particle size effect of encapsulated cerium nitrate into pH sensitive microcapsules. Takeshi Matsuda, Niteen Jadhav, Kiran B. Kashi, Mark Jensen, Victoria J. Gelling. *Progress in Organic Coatings*, Volume 90, January 2016, Pages 425-430.
- Synergism between cerium nitrate and sodium

dodecylbenzenesulfonate on corrosion of AA5052 aluminium alloy in 3wt.% NaCl solution. Jie Liu, Dapeng Wang, Lixin Gao, Daquan Zhang. Applied Surface Science, Volume 389, 15 December 2016, Pages 369-377.