

CALCIUM NITRATE (TETRAHYDRATE)

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SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

CALCIUM NITRATE (TETRAHYDRATE)
Calcium Nitrate Tetrahydrate; Nitrocalcite
CAS: 13477-34-4

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Nitrogen-calcium fertilizer, concrete admixture (accelerator/anti-freeze), water treatment (odour/corrosion control in sewage), fireworks/pyrotechnic oxidizer component, laboratory reagent. For industrial user only.
Uses advised against: All uses not specified in this section or in section 7.3.

1.3 Supplier's details:

SURAJ CHEMICALS
No 92, Govindappa Naicken Street, Shiva Complex, Chennai – 600001, Tamil Nadu, India
Tel: +91 - 7092722822, +91 - 9840284032 / +91 - 44 - 25393652, 42130281
Email: sales@surajchemicals.com | Website: www.surajchemicals.com
GST No: 33ACEPV8190L1ZZ

1.4 Emergency phone number:

Emergency Contact No: +91 - 7092722822, +91 - 9840284032

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Ox. Sol. 3	Oxidizing solid, Category 3, H272
Eye Irrit. 2	Eye irritation, Category 2, H319

2.2 GHS label elements, including precautionary statements:

GHS: Warning
Hazard statements:
Ox. Sol. 3: H272 – May intensify fire; oxidizer.
Eye Irrit. 2: H319 – Causes serious eye irritation.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220: Keep away from clothing and other combustible materials.
P221: Take any precaution to avoid mixing with combustibles/organic materials.
P264: Wash hands thoroughly after handling.
P280: Wear protective gloves/eye protection.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313: If eye irritation persists: Get medical advice/attention.
P370+P378: In case of fire, use water spray or fog to extinguish.
P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards which do not result in classification:

Oxidizer – contact with combustible/organic materials may increase fire risk. Highly hygroscopic. Not a PBT or vPvB substance.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Calcium Nitrate Tetrahydrate
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 13477-34-4	Calcium Nitrate Tetrahydrate — Ox. Sol. 3: H272; Eye Irrit. 2: H319 – Warning	≥ 98% (technical/fertilizer grade)

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

3.2 Mixtures:

Non-applicable

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first-aid measures:

Request medical assistance if symptoms persist, showing the SDS of this product.

By inhalation:

Remove the affected person to fresh air. Seek medical attention if breathing difficulty or irritation persists.

By skin contact:

Wash with plenty of water and soap. Remove contaminated clothing.

By eye contact:

Rinse immediately with plenty of water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek medical attention as irritation may be significant.

By ingestion/aspiration:

Rinse mouth with water. Give water to drink if conscious. Do not induce vomiting. Seek medical attention if large quantities are ingested.

4.2 Most important symptoms/effects, acute and delayed:

Irritation of eyes; mild irritation of skin/respiratory tract from dust. See sections 2 and 11.

4.3 Indication of immediate medical attention and special treatment needed, if necessary:

Treat symptomatically. No specific antidote known.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:

Suitable: Water spray/fog is preferred, as it also cools and dilutes the oxidizer.

Unsuitable: Avoid using dry chemical powder alone on bulk fires involving this oxidizer; use with water where possible.

5.2 Specific hazards arising from the chemical:

Non-combustible itself but is an oxidizer that can intensify fire and support combustion of other materials, particularly combustible/organic materials. Decomposes on strong heating releasing oxygen and nitrogen oxide fumes.

5.3 Special protective actions for fire-fighters:

Evacuate non-essential personnel. Wear self-contained breathing apparatus and full protective clothing. Cool containers exposed to fire with water spray from a safe distance.

Additional provisions:

Avoid inhalation of decomposition fumes (nitrogen oxides). Contain fire-fighting water run-off.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Remove sources of ignition and combustible/organic material from the vicinity. Avoid raising dust. Use personal protective equipment as per section 8.

For emergency responders:

Wear suitable protective equipment. See section 8.

6.2 Environmental precautions:

Avoid release to drains, water courses or soil, as it contributes nitrogen load. Contain spillage.

6.3 Methods and materials for containment and cleaning up:

Sweep up carefully (material is hygroscopic and may cake) and place in a suitable, clean, dry, labelled container away from combustible materials for disposal or reuse. Wash residual spill area with water.

6.4 Reference to other sections:

See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

A. General precautions for safe use:

Avoid generation and inhalation of dust. Avoid contact with eyes and skin. Keep away from combustible/organic materials, reducing agents and powdered metals.

B. Technical recommendations for the prevention of fires and explosions:

Segregate from combustible and organic materials. Keep containers tightly closed and away from heat/ignition sources. For bulk storage, consult Suraj Chemicals.

C. Technical recommendations on general occupational hygiene:

Do not eat, drink or smoke while handling. Wash hands thoroughly after use.

D. Technical recommendations to prevent environmental risks:

Prevent spillage from entering drains or water courses.

7.2 Conditions for safe storage, including any incompatibilities:

A. Specific storage requirements:

Minimum Temp.	Ambient
Maximum Temp.	30°C
Maximum time	Typical value – refer to current specification sheet

B. General conditions for storage:

Store in a cool, dry, well-ventilated place in tightly closed, moisture-proof containers, segregated from combustible/organic materials and reducing agents. Highly hygroscopic – protect from humidity. For additional information see subsection 10.5.

7.3 Specific end use(s):

Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

No specific occupational exposure limit established for calcium nitrate itself; a general particulate (nuisance dust) limit is applicable, per the Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987):

Identification	Occupational Exposure Limit Type	Value
Calcium Nitrate (as inert/nuisance dust) CAS: 13477-34-4	Time Weighted average concentration (8 hrs), total dust	10 mg/m ³

8.2 Appropriate engineering controls:

Use local exhaust ventilation where dust may be generated.

B. Respiratory protection:

Dust mask/respirator recommended where dust is generated.

C. Specific protection for the hands:

Protective gloves recommended.

D. Eye and face protection:

Chemical safety goggles against dust and splash.

E. Bodily protection:

Standard work clothing; antistatic footwear recommended given oxidizer hazard.

F. Additional emergency measures:

Emergency eyewash station should be available in the work area.

Environmental exposure controls:

Avoid environmental spillage. See subsection 7.1.D.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance

Physical state at 20°C	Solid (crystalline granules/prills)
Appearance	White to pale yellow granules
Color	White to pale yellow
Odor	Odorless
Odour threshold	Not relevant
Volatility	
Decomposition temperature	≈ 132°C (loses water of crystallization; decomposes at higher temperature)
Vapour pressure at 20°C	Negligible (solid)
Evaporation rate at 20°C	Non-applicable (solid)
Product Description	
Molecular weight	≈ 236.15 g/mol (tetrahydrate)
Density / Relative density at 20°C	≈ 1.82 g/cm³
Bulk density	Typical value – refer to current specification sheet
pH (5% aqueous solution)	≈ 6.0 – 7.0 (near neutral)
Solubility in water at 20°C	Highly soluble, > 1000 g/L
Partition coefficient n-octanol/water	Not relevant (inorganic salt)
Melting point/freezing point	≈ 42.7°C (tetrahydrate)
Flammability	
Flash Point	Non-applicable
Flammability (solid, gas)	Non-flammable but oxidizing
Autoignition temperature	Non-applicable
Lower / Upper flammability limit	Non-applicable
Particle Characteristics	
Median equivalent diameter	Typical value – refer to current specification sheet

* Values marked "Typical value" are not standardized and vary by batch/grade – refer to the current specification sheet.

9.2 Other information:

Explosive properties	Not explosive on its own; oxidizer
Oxidising properties	H272 – May intensify fire; oxidizer (Ox. Sol. 3)
Corrosive to metals	Not relevant
Heat of combustion	Non-applicable (non-combustible)
Viscosity	Non-applicable (solid)
Refraction index	Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity:

Strong oxidizer. Reacts with combustible/organic materials, reducing agents and powdered metals, increasing fire risk. Highly hygroscopic; absorbs moisture from air.

10.2 Chemical stability:

Stable under recommended storage conditions (cool, dry, closed containers, away from combustibles). Deliquesces on exposure to moist air.

10.3 Possibility of hazardous reactions:

May intensify a fire involving combustible materials. Hazardous reactions leading to excessive temperature or pressure are not otherwise expected under normal conditions.

10.4 Conditions to avoid:

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Absorbs moisture	Avoid prolonged heating	Not significant	Avoid – highly hygroscopic

10.5 Incompatible materials:

Combustible / Organic Materials	Reducing Agents	Powdered Metals	Moisture
Avoid contact – fire risk	Avoid contact	Avoid contact	Avoid – deliquescent

10.6 Hazardous decomposition products:

Nitrogen oxides (NOx) and oxygen on strong heating/decomposition.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect):

Low acute oral toxicity; large doses may cause gastrointestinal irritation, methemoglobinemia risk at very high nitrate intake (general nitrate-salt effect).

B. Inhalation (acute effect):

Dust may cause irritation of the respiratory tract.

C. Contact with skin and eyes (acute effect):

Causes serious eye irritation. Not expected to be a significant skin irritant under normal use.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):

Classification criteria for carcinogenicity, mutagenicity and reproductive toxicity are not met based on available data. IARC: Not listed.

E. Sensitizing effects:

Classification criteria for respiratory or skin sensitisation are not met based on available data.

F. Specific target organ toxicity (STOT) – single exposure:

Classification criteria are not met based on available data.

G. Specific target organ toxicity (STOT) – repeated exposure:

Classification criteria are not met based on available data.

H. Aspiration hazard:

Not relevant (solid).

Product-specific toxicological information:

Identification	Acute Toxicity	Genus
Calcium Nitrate CAS: 13477-34-4	LD50 oral: ≈ 3850 mg/kg (practically non-toxic)	Rat
	LD50 dermal: Not established	–

SECTION 12: ECOLOGICAL INFORMATION

Low acute aquatic toxicity; contributes nitrogen load which may promote eutrophication at high concentrations.

12.1 Toxicity:

Identification	Acute Toxicity	Species	Genus
Calcium Nitrate CAS: 13477-34-4	LC50: > 100 mg/L (96h) – low acute toxicity	Non-applicable	Fish

12.2 Persistence and degradability:

Dissociates in water to calcium and nitrate ions; nitrate is subject to natural nitrogen cycling.

12.3 Bioaccumulative potential:

Not expected to bioaccumulate (inorganic salt, log Pow not applicable).

12.4 Mobility in soil:

Koc	Henry	Dry Soil	Moist Soil
Not relevant	Not relevant	Highly mobile (soluble)	Highly mobile (soluble)

12.5 Results of PBT and vPvB assessment:

Non-applicable – inorganic substance, PBT/vPvB criteria do not apply.

12.6 Other adverse effects:

Excessive nitrogen input to water bodies may contribute to eutrophication/algal bloom.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:

Non-hazardous for disposal purposes when kept free of combustible contamination; may be used as fertilizer per local agricultural norms, or disposed of via a licensed waste contractor in accordance with local regulations. Keep separate from combustible waste.

Refer to national and local regulations on waste management.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023):

14.1 UN number	UN1454
14.2 UN proper shipping name	CALCIUM NITRATE
14.3 Transport hazard class(es)	5.1
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22):

14.1 UN number	UN1454
14.2 UN proper shipping name	CALCIUM NITRATE
14.3 Transport hazard class(es)	5.1
14.4 Packing group	III
14.5 Marine pollutant	No
14.6 Special precautions for user	EmS Codes: F-A, S-Q Segregation group: Not relevant
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024):

14.1 UN number	UN1454
14.2 UN proper shipping name	CALCIUM NITRATE
14.3 Transport hazard class(es)	5.1
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question:

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation:

Manufacture, Storage and Import of Hazardous Chemicals Rules 1989
The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
Public Liability Insurance Act, 1991

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

H272: May intensify fire; oxidizer.

H319: Causes serious eye irritation.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources:

The United Nations Economic Commission for Europe (UNECE); publicly available GHS classification references.

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log-POW: Octanol-water partition coefficient | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET