

ZINC NITRATE (HEXAHYDRATE)

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SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

ZINC NITRATE (HEXAHYDRATE)
Zinc nitrate hexahydrate; Zn(NO3)2.6H2O
CAS: 13478-38-1

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Textile dyeing/mordant, leather tanning auxiliary, chemical catalyst and reagent manufacture, fertilizer 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. 2	Oxidising solids, Category 2, H272
Eye Irrit. 2	Eye irritation, Category 2, H319
Aquatic Acute 1	Hazardous to the aquatic environment, acute hazard, Category 1, H400

2.2 GHS label elements, including precautionary statements:

GHS: Danger

Hazard statements:

Ox. Sol. 2: H272 – May intensify fire; oxidizer.
Eye Irrit. 2: H319 – Causes serious eye irritation.
Aquatic Acute 1: H400 – Very toxic to aquatic life.

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.
P264: Wash hands thoroughly after handling.
P273: Avoid release to the environment.
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, foam, dry chemical or carbon dioxide to extinguish.
P501: Dispose of contents/container in accordance with local/national regulations.

2.3 Other hazards which do not result in classification:

Not relevant

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Zinc nitrate hexahydrate
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 13478-38-1	Zinc nitrate hexahydrate — Ox. Sol. 2: H272; Eye Irrit. 2: H319; Aquatic Acute 1: H400 – Danger	≥ 98%

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 person affected from the area of exposure and provide fresh air. Seek medical attention if respiratory irritation persists.

By skin contact:

Remove contaminated clothing. Rinse skin thoroughly with plenty of water and soap.

By eye contact:

Rinse eyes thoroughly with lukewarm water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek medical attention if irritation persists.

By ingestion/aspiration:

Rinse mouth with water. Do not induce vomiting. Give water to drink if the person is conscious. Seek medical attention.

4.2 Most important symptoms/effects, acute and delayed:

Causes serious eye irritation. May cause mild irritation to skin and respiratory tract. Acute and delayed effects are further indicated in section 11.

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

Treat symptomatically. No specific antidote.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:

Suitable: Water spray, foam, dry chemical powder, carbon dioxide – select per surrounding fire. Water is effective as the product is highly water soluble.

Unsuitable: None known.

5.2 Specific hazards arising from the chemical:

Oxidising solid – may intensify fire if mixed with combustible materials. Not itself flammable but will support/accelerate combustion of other materials. Decomposes on strong heating to release toxic nitrogen oxide fumes.

5.3 Special protective actions for fire-fighters:

Evacuate non-essential personnel. Wear self-contained breathing apparatus and full protective clothing, particularly where the product is involved in a fire with combustible materials.

Additional provisions:

Cool fire-exposed containers with water if safe to do so. Avoid inhaling fumes from the fire. Contain fire-fighting water to prevent environmental discharge.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Avoid contact with skin and eyes. Keep away from combustible materials and ignition sources. Use personal protective equipment described in section 8.

For emergency responders:

Wear protective equipment described in section 8. Keep unprotected persons away.

6.2 Environmental precautions:

Avoid discharge into drains, soil or water courses – the product is very toxic to aquatic life. Notify the relevant authority in case of significant environmental release.

6.3 Methods and materials for containment and cleaning up:

Sweep/collect and place in a suitable, labelled, non-combustible container, keeping away from combustible materials. Dissolve and contain spill liquid/wash water for proper disposal; do not flush to drains.

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:

Keep away from combustible materials, reducing agents and organic substances. Avoid contact with skin and eyes. Handle with adequate ventilation.

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

Store and handle separately from combustibles, organic materials and reducing agents to prevent intensification of fire. Containers must be used exclusively for this product.

C. Technical recommendations on general occupational hygiene:

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

D. Technical recommendations to prevent environmental risks:

Prevent product or spillage from reaching drains, soil or water courses.

7.2 Conditions for safe storage, including any incompatibilities:

A. Specific storage requirements:

Storage temperature	Ambient, away from heat sources (below melting point ~36°C)
Storage condition	Tightly closed containers, away from combustibles
Shelf life	Typical value – refer to current specification sheet

B. General conditions for storage:

Store away from combustible and organic materials, reducing agents and strong acids (section 10). Keep containers tightly closed, in a cool, dry, well-ventilated area, segregated from incompatible materials.

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 substance-specific occupational exposure limit is established in India for zinc nitrate. General guidance limits for particulates not otherwise classified (PNOC) are provided below:

Identification	Occupational Exposure Limit Type	Value
Particulates not otherwise classified (PNOC)	Total dust, TWA (8 hrs)	10 mg/m³
	Respirable fraction, TWA (8 hrs)	3 mg/m³

8.2 Appropriate engineering controls:

Use local exhaust ventilation where dust is generated, in order to keep exposure below the limits in 8.1.

B. Respiratory protection:

Use a particulate filtering respirator where dust exposure limits may be exceeded.

C. Specific protection for the hands:

Protective gloves (e.g. nitrile or PVC) recommended.

D. Eye and face protection:

Safety glasses or chemical splash goggles recommended – the product causes serious eye irritation.

E. Bodily protection:

Standard industrial workwear; flame-resistant clothing recommended where combustible materials are also present.

F. Additional emergency measures:

Eyewash station recommended in the work area.

Environmental exposure controls:

Prevent release of the product to the environment. See subsection 7.1.D.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

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Appearance	
Physical state at 20°C	Solid (crystalline)
Appearance	Crystalline solid, deliquescent
Color	White to colorless
Odor	Odorless
Odour threshold	Not applicable
Volatility	
Boiling point at atmospheric pressure	Decomposes before boiling
Vapour pressure at 20°C	Negligible
Evaporation rate at 20°C	Not relevant (solid)
Product Description	
Density / Relative density at 20°C	2.065 g/cm³
pH (5% aqueous solution)	4 – 5.5 (slightly acidic)
Solubility in water at 20°C	Highly soluble (> 180 g/100 mL)
Partition coefficient n-octanol/water	Not applicable (inorganic salt)
Decomposition temperature	≈ 105–130°C (loses water of crystallisation; decomposes further at higher temperature)
Melting point/freezing point	36°C
Flammability	
Flash Point	Not applicable (solid, non-flammable)
Flammability (solid, gas)	Non-flammable; supports combustion of other materials (oxidiser)
Autoignition temperature	Not applicable
Lower / Upper flammability limit	Not applicable
Particle Characteristics	
Median particle size	Typical value – refer to current specification sheet

Values above are typical for the commercial grade; refer to current specification sheet for guaranteed values.

9.2 Other information:

Explosive properties	Not explosive on its own; may intensify fire/explosion risk if mixed with combustibles
Oxidising properties	H272 – May intensify fire; oxidiser
Corrosive to metals	Not relevant
Self-heating	Not self-heating
Water reactivity	Dissolves readily; not violently reactive with water

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity:

Strong oxidiser; reacts with combustible, organic and readily oxidisable materials, potentially intensifying fire. May react with reducing agents.

10.2 Chemical stability:

Chemically stable under the indicated conditions of storage, handling and use when kept away from heat and combustible materials.

10.3 Possibility of hazardous reactions:

Contact with combustible or readily oxidisable materials may lead to fire/intensified combustion.

10.4 Conditions to avoid:

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Not applicable	Avoid strong heating (decomposition, releases NOx)	Not applicable	Deliquescent – keep container closed

10.5 Incompatible materials:

Combustible / Organic Materials	Reducing Agents	Strong Acids
Avoid contact (fire/oxidation risk)	Avoid direct contact	Avoid direct contact

10.6 Hazardous decomposition products:

Nitrogen oxide fumes (NOx) and zinc oxide on strong thermal 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):

May cause gastrointestinal irritation, nausea and vomiting if ingested in quantity. Nitrate content may contribute to methaemoglobinaemia at very high doses (general property of soluble nitrate salts).

B. Inhalation (acute effect):

Dust may cause irritation to the respiratory tract.

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

Causes serious eye irritation. May cause mild skin irritation on prolonged contact.

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

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

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 applicable (solid).

Product-specific toxicological information:

Identification	Acute Toxicity	Genus
Zinc nitrate hexahydrate CAS: 13478-38-1	LD50 oral: 1850 mg/kg bw	Rat
	LD50 dermal: > 2000 mg/kg bw	Rabbit

SECTION 12: ECOLOGICAL INFORMATION

Very toxic to aquatic life.

12.1 Toxicity:

Identification	Acute Toxicity	Species	Genus
Zinc nitrate (as Zn) CAS: 13478-38-1	LC50: 0.6 – 2.0 mg/L (96h, as Zn)	Non-applicable	Fish
	EC50: 0.1 – 1.0 mg/L (48h, as Zn)	Daphnia magna	Crustacean

12.2 Persistence and degradability:

Inorganic substance; the concept of biodegradability is not applicable. Nitrate ion is readily assimilated/degraded biologically; zinc ion does not degrade.

12.3 Bioaccumulative potential:

Zinc is an essential trace element and bioaccumulation is physiologically regulated in most organisms, though it may occur at elevated environmental concentrations.

12.4 Mobility in soil:

Koc	Henry	Dry Soil	Moist Soil
Not relevant	Not relevant	High (soluble salt)	High (soluble salt)

12.5 Results of PBT and vPvB assessment:

Not applicable (inorganic substance).

12.6 Other adverse effects:

Nitrate content may contribute to eutrophication of surface water bodies if released in quantity.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:

Dissolve/dilute and neutralise as appropriate, then dispose of via a licensed waste disposal contractor in accordance with local and national regulations. Do not discharge directly to drains or water courses. Keep away from combustible waste during storage prior to disposal.
Refer to national and local regulations on waste management.

SECTION 14: TRANSPORT INFORMATION

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

14.1 UN number	UN1514
14.2 UN proper shipping name	ZINC NITRATE
14.3 Transport hazard class(es)	5.1
14.4 Packing group	III
14.5 Environmental hazard	Yes
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):

14.1 UN number	UN1514
14.2 UN proper shipping name	ZINC NITRATE
14.3 Transport hazard class(es)	5.1
14.4 Packing group	III
14.5 Marine pollutant	Yes
14.6 Special precautions for user	EmS Codes: F-A, S-Q
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

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

14.1 UN number	UN1514
14.2 UN proper shipping name	ZINC NITRATE
14.3 Transport hazard class(es)	5.1
14.4 Packing group	III
14.5 Environmental hazard	Yes
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)
The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996

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.
- H400: Very toxic to aquatic life.

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 for the listed CAS number.

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 | IARC: International Agency for Research on Cancer | NOx: Nitrogen oxides

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