SAFETY DATA SHEET (SDS)

in accordance with Regulation (EC) No 1907/2006 (REACH), Annex II — Regulation (EU) 2020/878

Date: 18.10.2026 | Version: 6 | EN

Nitric Acid

nitric acid

CAS 7697-37-2

HNO_3 | EC 231-714-2

MOLAR MASS	LOGP
63.01	-0.13

HAZARD CLASSIFICATION (GHS / CLP)



Danger

H272 | H330 | H314

Hazard class scope limited to the harmonised classification (CLP Annex VI); classes outside the harmonised entry may require supplier self-classification (CLP Art. 4(3)) — verify with the supplier safety data sheet.

WORKING DRAFT · 工作草案

1. Identification of the substance/mixture and of the company/undertaking

1.1 Substance name	Nitric Acid
1.1 IUPAC name	nitric acid
1.1 CAS number	7697-37-2
1.1 EC number	231-714-2
1.1 PubChem CID	944
1.1 InChIKey	GRYLNZFGIOXLOG-UHFFFAOYSA-N
1.1 SMILES	[N+](=O)(O)[O-]
1.1 Molecular formula	HNO_3 [7]
1.1 Molar mass	63.013 g/mol [7]
1.1 Exact mass	62.9956 Da [7]

1.2 Uses

For laboratory and research purposes. Not for use in the production of food, medicines or cosmetics without appropriate authorisation.

1.3 Details of the supplier

REFERENCE COPY — NO SUPPLIER DETAILS — NOT FOR DISTRIBUTION	Supplier details are not included in this reference copy. The supplier placing the substance on the market must complete this section and remains responsible for the sheet under REACH. MolGod.org prepares documentation and is not the supplier of this substance.

1.4 Emergency telephone number

Emergency telephone	112 (EU-wide emergency number)

Contact the poison centre designated in the country of placing on the market (CLP Art. 45).

2. Hazards identification

GHS:



PPE:



Danger

Hazard statements (H) [3][4][11]

H272	May intensify fire; oxidiser
H330	Fatal if inhaled
H314	Causes severe skin burns and eye damage
EUH071	Corrosive to the respiratory tract.

Precautionary statements (P) [3][4][11]

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
P260	Do not breathe dust/fume/gas/mist/vapours/spray
P264	Wash thoroughly after handling
P271	Use only outdoors or in a well-ventilated area
P280	Wear protective gloves/protective clothing/eye protection/face protection
P284	Wear respiratory protection
P301+P330+P331	IF SWALLOWED: Rinse mouth; Do NOT induce vomiting
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing; Rinse skin with water or shower
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes; Remove contact lenses, if present and easy to do. Continue rinsing
P310	Immediately call a POISON CENTER or doctor/physician
P320	Specific treatment is urgent
P321	Specific treatment
P363	Wash contaminated clothing before reuse
P370+P378	In case of fire: Use appropriate media to extinguish
P403+P233	Store in a well-ventilated place: Keep container tightly closed
P405	Store locked up
P501	Dispose of contents/container to an approved waste collection point

Hazard class scope limited to the harmonised classification (CLP Annex VI); classes outside the harmonised entry may require supplier self-classification (CLP Art. 4(3)) — verify with the supplier safety data sheet.

WORKING DRAFT · 工作草案

3. Composition/information on ingredients

Substance type	pure substance
CAS Number	7697-37-2
EC number	231-714-2
Molecular formula	HNO_3
Concentration	≥99% (typical reagent-grade purity — to be confirmed by the supplier's specification)
Clp index no	007-004-00-1
Specific concentration limits / M-factor (CLP Annex VI Table 3)	SCL: C ≤ 70 %; H272: C ≥ 65 %; H314: C ≥ 20 %; H314: 5 % ≤ C < 20 % · ATE: inhalation: ATE = 2,65 mg/L [3]

4. First aid measures



Inhalation

Move the affected person to fresh air. Keep at rest. Call a physician. Semi-sitting position. Give oxygen if available. If not breathing: artificial respiration (qualified personnel only). [1][2][16]

Skin contact

Remove contaminated clothing. Rinse skin with soap and water (min. 15 minutes). Call a physician immediately. [1][2][16]

Eye contact

Rinse eyes with running water (min. 15 minutes). Remove contact lenses if possible. If irritation persists — consult an ophthalmologist. [1][2][16]

Ingestion

Do NOT induce vomiting (unless directed by a physician). Rinse mouth with water. Never give anything by mouth to an unconscious person. Emergency number: 112 (EU-wide). Contact the poison centre designated in your country (CLP Art. 45). [1][2][16]

Symptoms and effects

cough, shortness of breath, headache, dizziness; skin redness and irritation. [3][11]

Notes for physician

Requires verification

Emergency numbers: Emergency: 112 (EU-wide). Poison centre: as designated in the country of placing on the market (CLP Art. 45).

WORKING DRAFT 工作草案

5. Firefighting measures

Suitable extinguishing media	Water in LARGE quantities (cooling). Water mist. [1][2][16]
Unsuitable extinguishing media	CO2 and dry powder (ineffective for an oxidiser). [1][2][16]
Specific hazards	Thermal decomposition products: NOx. [17]
Advice for firefighters	Use self-contained breathing apparatus (SCBA). Full protective suit. [1][2][16]

6. Accidental release measures

Personal precautions	Use personal protective equipment (see Section 8). Avoid breathing vapours. [1][2][16]
Environmental precautions	Prevent entry into sewers, groundwater and surface water. [1][2][16]
Methods for containment and cleaning up	1. Ventilate INTENSIVELY — brown NO2 fumes, lethal >100 ppm 2. FULL PPE: butyl 0.7mm + full-face mask with NO2 filter 3. Do NOT use paper/sawdust (self-ignition with conc. HNO3) 4. Contain with dry vermiculite 5. SLOWLY neutralise with dilute NaHCO3 or Ca(OH)2 (risk of violent reaction!) 6. Collect into HDPE 7. Wash the area copiously with water
Related sections	8; 13
Large spill	1. EVACUATION 50-100m (NO2 vapours toxic over a wider radius) 2. Only HAZMAT teams with SCBA self-contained breathing apparatus 3. With conc. HNO3 (>65%): brown nitrous fumes — call the fire brigade 4. Do NOT use pressurised water (splashing + evaporation + exothermic reaction) 5. Containment with lime + controlled neutralisation 6. Notify WIOŚ (environmental protection inspectorate) + Crisis Management Centre
Absorbent	vermiculite (dry, NOT cellulose!)
HAZMAT response required	Yes
Required PPE	Gloves: butyl rubber (>0.7mm) — NOT nitrile/latex!; Safety goggles: Yes; Face shield: Yes; Respiratory protection: full mask NO2 filter; Protective clothing: Tychem F

WORKING DRAFT 工作草案

7. Handling and storage

Precautions	Work in a fume hood or with adequate ventilation. No eating, drinking or smoking in the work area. [1][2][16]
Storage temperature	Store at room temperature (15-25°C) or as indicated on the label. [1][2][16]
Humidity	Store in a dry place (<60% RH). [1][2][16]
Light	Protect from direct sunlight. [1][2][16]
Incompatible materials	Strong oxidizers, strong bases, Base metals (hydrogen evolution). [17]

8. Exposure controls/personal protection

8.1 Control parameters

OEL — NDS (Poland)	NDS = 1.4 mg/m³ (TWA) · NDSCh = 2.6 mg/m³ (STEL) — Rozp. MRiPS Dz.U. 2024 poz.1017 [22]

OEL (EU)	The EU OEL value has not been verified against the available dataset — check the IOELV/BOELV directives; do not assume the absence of a value.
DNEL	No data available.
PNEC	No data available.

8.2 Personal protective equipment (PPE) [5][6][18]



9. Physical and chemical properties

Property (item 9.1)	Value	Source
Physical state	Liquid	
Colour	Transparent, colorless, or yellowish, fuming, hygroscopic, corrosive liquid [7]	
Odour	Characteristic choking odor [7]	
pH (1% aqueous solution)	No data available.	
Melting point	-41.59°C (experimental data) [7]	
Boiling point	83°C (experimental data) [7]	
Flash point	No data available.	
Flammability	No data available.	
Lower and upper explosion limit	No data available.	
Density (20°C)	1.5 g/cm³ [7]	
Vapour pressure	8.413 kPa (63.1 mmHg, 25°C) (experimental data) [7]	
Relative vapour density	2.18 [21]	
Dynamic viscosity	0.746 mPa·s [7]	
Kinematic viscosity	No data available.	
Refractive index nD²⁰	1.393 (experimental data) [7]	
Auto-ignition temperature	No data available.	
Decomposition temperature	No data available.	
Dissociation constant (pKa)	pKa = -1.4 [8]	

WORKING DRAFT 工作草稿

Property (item 9.1)	Value	Source
Water solubility	Miscible with water in all proportions. [8]	
Particle characteristics	Not applicable (REACH 9.1(r))	
Partition coefficient n-octanol/water (log value)	-0.13 [8]	
Molar mass	63.013 g/mol [7]	
Molecular formula	HNO_3 [7]	
Lipinski rule (RO5)	**PASS**	

Where a property above reads "No data available", no measured value was found in the public sources consulted for this substance. The property has not been determined by MolGod.org and no value is inferred. "Not applicable" means the property has no meaning for this substance in the form supplied.

10. Stability and reactivity

Reactivity	Stable under normal storage and handling conditions.
Chemical stability	May undergo violent catalytic decomposition on contact with heavy metals (Mn, Fe, Cu, Cr) or contaminants. [17]
Hazardous reactions	Catalytic decomposition may proceed violently, releasing large amounts of oxygen, which accelerates the fire of surrounding combustible materials. [17]
Conditions to avoid	Temperature >50°C, UV light, heavy metals, organic contaminants. Decomposition releasing oxygen (O_2) and heat. [17]
Incompatible materials	Strong oxidizers, strong bases, Base metals (hydrogen evolution).
Decomposition products	Thermal decomposition products: NOx.

11. Toxicological information

LD50 (oral)	430 mg/kg (rat) [9]
LD50 (dermal)	No data available.
LC50 (inhalation)	LC50 244 mg/m3 (rat) [10][11]
Skin irritation	Category 1 (H314) — corrosive; sub-category (1A/1B/1C) per CLP Annex VI entry. [3][11]
Eye irritation	Serious eye damage — covered by the corrosive classification (H314; CLP Annex I 3.3.2.1). [3][11]
Sensitisation	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
Mutagenicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
Carcinogenicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
IARC classification (carcinogenicity)	No individual IARC monograph for this CAS — this is not confirmation of the absence of carcinogenicity (cf. CLP/GHS classification in section 2).
Reproductive toxicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
STOT — single exposure	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
STOT — repeated exposure	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
Aspiration hazard	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]

WORKING DRAFT 工作草案

12. Ecological information

Aquatic toxicity	No data available.
Persistence / biodegradability	No data available.
Bioaccumulative potential	log Kow = -0.13 [8]. Low bioaccumulation potential (log Kow < 4.5 — PBT/vPvB screening criterion per ECHA Guidance R.11). [19][20]
Mobility in soil	No data available.
PBT/vPvB assessment	Insufficient data to assess PBT/vPvB.
Endocrine disrupting properties	No information.

13. Disposal considerations

Disposal method	Hand over for disposal to licensed contractors in accordance with national and local regulations. Do not discharge into sewers.
Waste code (EWC)	16 05 06* — Laboratory and analytical chemicals (e.g. chemical reagents) containing hazardous substances. Verification of the EWC code required. [15]
Packaging	Cleaned packaging may be recycled. Contaminated packaging must be treated as hazardous waste.

14. Transport information



Class 5.1 — Oxidising substances



Class 6.1 — Toxic substances



Class 8 — Corrosive substances

UN number	UN 2031 (>=20% to <=70%) | UN 2032 (red fuming, >70%) [12]
Proper shipping name	NITRIC ACID, OTHER THAN RED FUMING [12]
Transport hazard class	8 — Corrosive substances [12]
Packing Group	II [12]
Environmental hazard	Not classified as environmentally hazardous for transport (no H400/H410/H411 in CLP Annex VI; no marine pollutant mark required) [3]
Special precautions	Handle as dangerous goods according to the assigned class (ADR/IMDG/IATA); apply the precautions appropriate to that class.
CN/HS code	2808 00 00 [14]
Notes	Transport classification per ADR / UN Model Regulations (UN number, class and packing group above). Verify the ADR/IMDG/IATA edition in force on the date of shipment. [12]
Subsidiary hazard (class)	5.1 (Oxidizer) — when concentration >65%
EmS code (IMDG)	F-A, S-Q [13]

15. Regulatory information

SVHC status	SVHC status not verified against the available dataset — check the current ECHA Candidate List; do not assume absence. [1]
REACH Annex XIV	Not verified against the ECHA Authorisation List — check REACH Annex XIV. [1]
REACH Annex XVII	Not confirmed in the available Annex XVII dataset — verify against the current ECHA list before placing on the market; do not assume absence of restriction. [1]
Index number (CLP Annex VI)	007-004-00-1
Harmonised classification	Yes
OEL — Journal of Laws (Poland)	Dz.U. 2024 poz. 1017 (NDS 1.4 mg/m³, NDSCh 2.6 mg/m³)

WORKING DRAFT · 工作草稿

16. Other information

Substance type: oxidizer

Legal status of classification: harmonised under CLP Annex VI — Reg. (EC) No 1272/2008 (as at the date of issue).Entries with an entry-into-force date after 18.10.2026 were omitted as future (not yet applicable).

Data aggregated automatically from public reference databases (PubChem, ECHA, NIST and others).

Scientific citations (10)

et al.. *Insight into the Amelioration Effect of Nitric Acid-Modified Biochar on Saline Soil Physicochemical Properties and Plant Growth.*. (2024). DOI: 10.3390/plants13233434

Dissolution Kinetics in Plasma-Enhanced Nitric Acid Solvolysis of CFRCs.. (2025). DOI: 10.3390/ma18184242

Yannis Ziouane, Gilles Leturcq. *New Modeling of Nitric Acid Dissociation Function of Acidity and Temperature*. ACS Omega (2018). DOI: 10.1021/acsomega.8b00302

et al.. *Ultrasonic-Assisted Photocatalytic Conversion of Air to Nitric Acid Under Ambient Conditions.*. (2026). DOI: 10.1002/advs.202517167

Simultaneous determination of gaseous nitric acid and particulate nitrate in ambient air using continuous samplers and chemiluminescent online analysers.. (2026). DOI: 10.1016/j.talanta.2026.130457

Full text of H statements

H272	May intensify fire; oxidiser
H330	Fatal if inhaled
H314	Causes severe skin burns and eye damage
EUH071	Corrosive to the respiratory tract.

Full text of P 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
P260	Do not breathe dust/fume/gas/mist/vapours/spray
P264	Wash thoroughly after handling
P271	Use only outdoors or in a well-ventilated area
P280	Wear protective gloves/protective clothing/eye protection/face protection
P284	Wear respiratory protection
P301+P330+P331	IF SWALLOWED: Rinse mouth; Do NOT induce vomiting
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing; Rinse skin with water or shower
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes; Remove contact lenses, if present and easy to do. Continue rinsing
P310	Immediately call a POISON CENTER or doctor/physician
P320	Specific treatment is urgent
P321	Specific treatment
P363	Wash contaminated clothing before reuse
P370+P378	In case of fire: Use appropriate media to extinguish
P403+P233	Store in a well-ventilated place: Keep container tightly closed
P405	Store locked up
P501	Dispose of contents/container to an approved waste collection point

Abbreviations

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
CAS	Chemical Abstracts Service

WORKING DRAFT · 工作草案

CLP	Classification, Labelling and Packaging (Reg. (EC) 1272/2008)
CMR	Carcinogenic, Mutagenic, toxic to Reproduction
DNEL	Derived No-Effect Level
EC	European Community number
EPI	Personal protective equipment
GHS	Globally Harmonized System
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods Code
SDS	Safety Data Sheet
LC50	Lethal Concentration, 50%
LD50	Lethal Dose, 50%
NDS	Maximum admissible concentration (workplace, PL)
NDSCh	Short-term exposure limit (PL)
OEL	Occupational Exposure Limit
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (Reg. (EC) 1907/2006)
STOT	Specific Target Organ Toxicity
SVHC	Substance of Very High Concern
TPSA	Topological Polar Surface Area
vPvB	very Persistent and very Bioaccumulative

Version history

v6 (18.10.2026)	Based on ECHA harmonised classification (Annex VI to CLP, ATP 23).

References

[1] EP and Council. Reg.(EC) No 1907/2006 (REACH). Art.31, Annex II. OJ EU L 396/2006. URL: https://eur-lex.europa.eu/eli/reg/2006/1907/oj Accessed: 2026-10-18.

[2] European Commission. Reg.(EU) 2020/878 — amending Annex II REACH. OJ EU L 203/2020. From 01.01.2023. URL: https://eur-lex.europa.eu/eli/reg/2020/878/oj Accessed: 2026-10-18.

[3] EP and Council. Reg.(EC) 1272/2008 (CLP) + ATP 23. OJ EU L 353/2008. (2026-07-07) URL: https://eur-lex.europa.eu/eli/reg/2008/1272/oj Accessed: 2026-10-18.

[4] United Nations. GHS Rev.9. ST/SG/AC.10/30/Rev.9. New York and Geneva: United Nations, 2021. URL: https://unece.org/transport/dangerous-goods/ghs-rev9-2021 Accessed: 2026-10-18.

[5] ISO. ISO 7010:2019 — Graphical symbols. Safety signs. URL: https://www.iso.org/standard/72424.html Accessed: 2026-10-18.

[6] ISO. ISO 3864-1:2011 — Safety colours and safety signs. URL: https://www.iso.org/standard/51021.html Accessed: 2026-10-18.

[7] PubChem. National Center for Biotechnology Information (NIH/NLM), chemical compound database. URL: https://pubchem.ncbi.nlm.nih.gov/compound/944

[8] Rumble, J.R., ed. CRC Handbook of Chemistry and Physics. 105th ed. Boca Raton: CRC Press, 2024. URL: https://hbcp.chemnetbase.com

[9] NIOSH. Registry of Toxic Effects of Chemical Substances (RTECS). Cincinnati: NIOSH. URL: https://www.cdc.gov/niosh/rtecs

[10] ECHA. REACH Registration Dossier (registered substance, acute toxicity study record). Helsinki: European Chemicals Agency. URL: https://echa.europa.eu/registration-dossier

[11] ECHA. European Chemicals Agency — harmonised classification inventory (CLP Annex VI). URL: https://echa.europa.eu

[12] UNECE. European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), 2025 edition (ECE/TRANS/352). Geneva: United Nations. URL: https://unece.org/adr

[13] IMO. International Maritime Dangerous Goods (IMDG) Code, 2024 ed. (Amendment 42-24, Res. MSC.556(108)). London: International Maritime Organization. URL: https://www.imo.org

[14] European Commission. Combined Nomenclature (Council Regulation (EEC) No 2658/87). Chapter 29. OJ EU L 256. URL: https://eur-lex.europa.eu/eli/reg/1987/2658/oj

[15] European Commission. Decision 2000/532/EC establishing a list of wastes (European Waste Catalogue). OJ EU L 226/3. URL: https://eur-lex.europa.eu/eli/dec/2000/532/oj

[16] European Chemicals Agency (ECHA). Guidance on the Compilation of Safety Data Sheets. Version 4.0. Helsinki: European Chemicals Agency, 2020. URL: https://echa.europa.eu/documents/10162/2324906/sds_en.pdf

[17] Urben, P.G., ed. Bretherick's Handbook of Reactive Chemical Hazards. 8th ed. Oxford: Academic Press.

[18] CEN. Personal protective equipment standards (EN ISO 374-1, EN 166, EN 149, EN 14387, EN ISO 20345). Brussels: European Committee for Standardization.

[19] ECHA. Guidance on Information Requirements and Chemical Safety Assessment, Chapter R.11: PBT/vPvB Assessment. Helsinki: European Chemicals Agency. URL: https://echa.europa.eu/guidance-documents/guidance-on-information-requirements-and-chemical-safety-assessment

[20] European Parliament and Council. Regulation (EC) No 1907/2006 (REACH), Annex XIII — Criteria for the identification of PBT and vPvB substances. OJ EU L 396/2006 (consolidated). URL: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006R1907-20140410

WORKING DRAFT · 工作草稿

[21] MOL-GOD. Value obtained by calculation from the molecular formula/molecular weight (the specific quantity and its formula are indicated at the respective field). Calculated value, not an experimental measurement. URL: https://www.nist.gov/pml/atomic-weights-and-isotopic-compositions-relative-atomic-masses

[22] MRiPS Regulation of 12.06.2018 — NDS/NDN. Journal of Laws 2024 item 1017. URL: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20240001017 Accessed: 2026-10-18.

External links

NIST: https://webbook.nist.gov/cgi/cbook.cgi?ID=7697-37-2

ChEMBL: https://www.ebi.ac.uk/chembl/compound_report_card/CHEMBL1352

NFPA 704 (supplementary information — NFPA/USA system; not a required element of an EU safety data sheet under REACH Annex II)



Legal notice: This document was generated automatically from data provided by PubChem (NIH), ECHA, NIST WebBook, ChemSpider (RSC) and other public databases. It DOES NOT REPLACE an approved Safety Data Sheet (SDS) compliant with Regulation (EC) No 1907/2006 (REACH). Before using the substance, verify the data against the manufacturer's current SDS.
Generator: Document generated automatically from ECHA harmonised classification (Annex VI to CLP) and public physicochemical databases.
Author: www.MolGod.org — platform for automated safety data sheets (SDS).
Issue date: 18.10.2026 | Document version: 6

WORKING DRAFT · 工作草案