# SAFETY DATA SHEET (SDS)

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

Date: 10.11.2026 | Version: 6 | EN

## trinickel disulfide

**CAS 12035-72-2**

$Ni_3S_2$ | EC 234-829-6

MOLAR MASS
**240.22**

### HAZARD CLASSIFICATION (GHS / CLP)



**Danger**

H350i | H341 | H331 | H372 | H317 | H400 | H410

*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.*

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

| | |
|---|---|
| **1.1 Substance name** | trinickel disulfide |
| **1.1 IUPAC name** | nickel;sulfanylidenenickel |
| **1.1 CAS number** | 12035-72-2 |
| **1.1 EC number** | 234-829-6 |
| **1.1 PubChem CID** | 25199732 |
| **1.1 InChIKey** | YGHCWPXPAHSSNA-UHFFFAOYSA-N |
| **1.1 SMILES** | S=[Ni].S=[Ni].[Ni] |
| **1.1 Molecular formula** | $Ni_3S_2$ [7] |
| **1.1 Molar mass** | 240.22 g/mol [7] |
| **1.1 Exact mass** | 239.7456 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][8]

| | |
|---|---|
| **H350i** | May cause cancer by inhalation |
| **H341** | Suspected of causing genetic defects |
| **H331** | Toxic if inhaled |
| **H372** | Causes damage to organs through prolonged or repeated exposure |
| **H317** | May cause an allergic skin reaction |
| **H400** | Very toxic to aquatic life |
| **H410** | Very toxic to aquatic life with long lasting effects |

### Precautionary statements (P) [3][4][8]

| | |
|---|---|
| **P201** | Obtain special instructions before use |
| **P202** | Do not handle until all safety precautions have been read and understood |
| **P260** | Do not breathe dust/fume/gas/mist/vapours/spray |
| **P271** | Use only outdoors or in a well-ventilated area |
| **P272** | Contaminated work clothing should not be allowed out of the workplace |
| **P273** | Avoid release to the environment |
| **P280** | Wear protective gloves/protective clothing/eye protection/face protection |
| **P302+P352** | IF ON SKIN: Wash with plenty of water |
| **P304+P340** | IF INHALED: Remove person to fresh air and keep comfortable for breathing |
| **P308+P313** | IF exposed or concerned: Get medical advice/attention |
| **P311** | Call a POISON CENTER or doctor/physician |
| **P314** | Get medical advice/attention if you feel unwell |
| **P321** | Specific treatment |
| **P333+P313** | If skin irritation or rash occurs: Get medical advice/attention |
| **P362+P364** | Take off contaminated clothing |
| **P391** | Collect spillage |
| **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 |

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**NOTE: CMR substance — employment of pregnant and breastfeeding women in work harmful to health is prohibited (Polish Labour Code Art. 176 § 1; Council of Ministers Regulation of 3 April 2017, Journal of Laws 2017 item 796).** [12][13]

**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.**

## 3. Composition/information on ingredients

| | |
|---|---|
| **Substance type** | pure substance |
| **CAS Number** | 12035-72-2 |
| **EC number** | 234-829-6 |
| **Molecular formula** | $Ni_3S_2$ |
| **Concentration** | ≥99% (typical reagent-grade purity — to be confirmed by the supplier's specification) |
| **Clp index no** | 028-007-00-4 |
| **Specific concentration limits / M-factor (CLP Annex VI Table 3)** | ATE: inhalation: ATE = 0,92 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][10]

### Skin contact

Remove contaminated clothing. Rinse skin with soap and water (min. 15 minutes). [1][2][10]

### Eye contact

Rinse eyes with running water (min. 15 minutes). Remove contact lenses if possible. If irritation persists — consult an ophthalmologist. [1][2][10]

### 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][10]

### Symptoms and effects

cough, shortness of breath, headache, dizziness. [3][8]

### 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).**

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## 5. Firefighting measures

| | |
|---|---|
| **Suitable extinguishing media** | Adapt extinguishing media to surroundings. CO2, dry powder, foam. |
| **Unsuitable extinguishing media** | No specific restrictions. |
| **Specific hazards** | Thermal decomposition products: SOx. [11] |
| **Advice for firefighters** | Use self-contained breathing apparatus (SCBA). Full protective suit. |

## 6. Accidental release measures

| | |
|---|---|
| **Personal precautions** | Use personal protective equipment (see Section 8). Avoid breathing dust. [1][2][10] |
| **Environmental precautions** | Prevent entry into sewers, groundwater and surface water. [1][2][10] |
| **Methods for containment and cleaning up** | Collect mechanically into suitable containers. Absorption: sand, vermiculite, diatomaceous earth. Do not sweep dry (dust formation). [1][2][10] |
| **Related sections** | 8; 13 |

## 7. Handling and storage

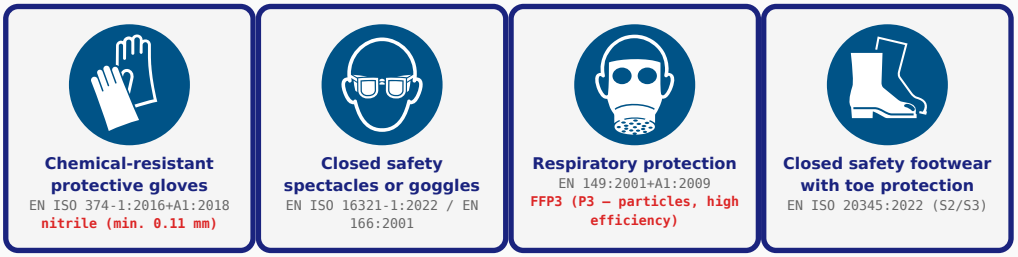
| | |
|---|---|
| **Precautions** | Work in a fume hood or with adequate ventilation. No eating, drinking or smoking in the work area. [1][2][10] |
| **Storage temperature** | Store at room temperature (15-25°C) or as indicated on the label. [1][2][10] |
| **Humidity** | Store in a dry place (<60% RH). [1][2][10] |
| **Light** | Protect from direct sunlight. [1][2][10] |
| **Incompatible materials** | Strong oxidizers, strong acids, strong bases. [11] |

## 8. Exposure controls/personal protection

### 8.1 Control parameters

| | |
|---|---|
| **OEL — NDS (Poland)** | No NDS (OEL) value in the available working list — verify in the current MRPiPS regulation before use; do not assume the absence of a limit value. |
| **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][14]




## 9. Physical and chemical properties

| Property (item 9.1) | Value | Source |
|---|---|---|
| **Physical state** | Solid | |
| **Colour** | Hexagonal crystals [7] | |

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| Property (item 9.1) | Value | Source |
|---|---|---|
| **Odour** | No data available. | |
| **pH (1% aqueous solution)** | No data available. | |
| **Melting point** | 790°C (experimental data) [7] | |
| **Boiling point** | No data available. | |
| **Flash point** | Not applicable (REACH 9.1(h)) | |
| **Flammability** | No data available. | |
| **Lower and upper explosion limit** | Not applicable (REACH 9.1(g)) | |
| **Density (20°C)** | 5.82 g/cm³ [7] | |
| **Vapour pressure** | No data available. | |
| **Relative vapour density** | Not applicable (REACH 9.1(q)) | |
| **Kinematic viscosity** | Not applicable (REACH 9.1(l)) | |
| **Auto-ignition temperature** | No data available. | |
| **Decomposition temperature** | Not applicable | |
| **Water solubility** | 0.517 g/L, 25°C [7] | |
| **Particle characteristics** | The particle size distribution has not been determined for this commercial form — required under Annex II 9.1(r); to be completed from the supplier's specification. | |
| **log Kow (XLogP3)** | Not applicable (REACH 9.1(n)) | |
| **Molar mass** | 240.22 g/mol [7] | |
| **Molecular formula** | $Ni_3S_2$ [7] | |

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** | Thermally stable under recommended conditions. |
| **Hazardous reactions** | No hazardous reactions known under normal conditions. |
| **Conditions to avoid** | High temperatures, direct sunlight, moisture. |
| **Incompatible materials** | Strong oxidizers, strong acids, strong bases. |
| **Decomposition products** | Thermal decomposition products: SOx. |

## 11. Toxicological information

| | |
|---|---|
| **LD50 (oral)** | No data available. |
| **LD50 (dermal)** | No data available. |
| **LC50 (inhalation)** | No data available. |
| **Skin irritation** | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][8] |
| **Eye irritation** | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][8] |
| **Sensitisation** | Skin, Category 1 (H317): May cause an allergic skin reaction. [3][8] |

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| | |
|---|---|
| **Mutagenicity** | Category 2 (harmonised classification, Annex VI to CLP). |
| **Carcinogenicity** | Category 1A/1B (harmonised classification, Annex VI to CLP). |
| **IARC classification (carcinogenicity)** | No individual IARC monograph — NOTE: substance classified as carcinogenic per ECHA CLP; absence of an IARC entry does NOT mean absence of carcinogenicity. |
| **Reproductive toxicity** | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][8] |
| **STOT — single exposure** | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][8] |
| **STOT — repeated exposure** | Category 1 (H372): Causes damage to organs through prolonged or repeated exposure. [3][8] |
| **Aspiration hazard** | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][8] |

## 12. Ecological information

| | |
|---|---|
| **Aquatic toxicity** | Harmonised classification (CLP Annex VI): H400 — Very toxic to aquatic life (Aquatic Acute 1); H410 — Very toxic to aquatic life with long lasting effects (Aquatic Chronic 1). Numerical $LC_{50}$/$EC_{50}$ data unverified in the available dataset — do not assume absence of toxicity. (M-factor for acute/chronic cat. 1 — to be verified per Table 3 of Annex VI, if assigned.) |
| **Persistence / biodegradability** | No data available. |
| **Bioaccumulative potential** | No data available. |
| **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. [9] |
| **Packaging** | Cleaned packaging may be recycled. Contaminated packaging must be treated as hazardous waste. |

## 14. Transport information




Class 6.1 — Toxic substances

| | |
|---|---|
| **UN number** | UN 3077 [7] |
| **Transport hazard class** | Suggested from GHS classification — VERIFICATION REQUIRED. |
| **Environmental hazard** | CLP classification (H400/H410) indicates aquatic environmental hazard — marine pollutant marking may be required; confirm per ADR 2.2.9 / IMDG criteria [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** | CN/HS code: verification required in the Eurostat Combined Nomenclature. |
| **Notes** | UN number per the indicated source. Verify the transport class and packing group in ADR Table A / UN Model Regulations before shipment. [7] |
| **Environmentally hazardous (mark: fish and tree)** | Yes |

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## 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** | Subject to general entries 28–30 of REACH Annex XVII (CMR substance cat. 1A/1B): sale to the general public prohibited — supply to professional users only. [1] |

## 16. Other information

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 10.11.2026 were omitted as future (not yet applicable).

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

### Scientific citations (10)


*NTP Toxicology and Carcinogenesis Studies of Nickel Subsulfide (CAS No. 12035-72-2) in F344 Rats and B6C3F1 Mice (Inhalation Studies).*. (1996).

D. M. Pasquariello, R. Kershaw, J. D. Passaretti et al.. *Low-temperature synthesis and properties of cobalt sulfide (Co9S8), nickel sulfide (Ni3S2), and iron sulfide (Fe7S8)*. Inorganic Chemistry (1984). DOI: 10.1021/ic00175a016

Kusal K. Das, R. Chandramouli Reddy, Ishwar B. Bagoji et al.. *Primary concept of nickel toxicity – an overview*. Journal of Basic and Clinical Physiology and Pharmacology (2018). DOI: 10.1515/jbcpp-2017-0171

Lynette B. Corbeil. *Antigenicity of rhabdomyosarcomas induced by nickel sulfide (Ni3S2)*. Cancer (1968). DOI: 10.1002/1097-0142(196802)21:2<184::aid-cncr2820210204>3.0.co;2-9

Junjie Huang, Yupeng Xing, Jinzhao Huang et al.. *Mo-doped one-dimensional needle-like Ni3S2 as bifunctional electrocatalyst for efficient alkaline hydrogen evolution and overall-water-splitting*. ChemPhysMater (2024). DOI: 10.1016/j.chphma.2023.11.001


### Full text of H statements

| | |
|---|---|
| **H350i** | May cause cancer by inhalation |
| **H341** | Suspected of causing genetic defects |
| **H331** | Toxic if inhaled |
| **H372** | Causes damage to organs through prolonged or repeated exposure |
| **H317** | May cause an allergic skin reaction |
| **H400** | Very toxic to aquatic life |
| **H410** | Very toxic to aquatic life with long lasting effects |

### Full text of P statements

| | |
|---|---|
| **P201** | Obtain special instructions before use |
| **P202** | Do not handle until all safety precautions have been read and understood |
| **P260** | Do not breathe dust/fume/gas/mist/vapours/spray |
| **P271** | Use only outdoors or in a well-ventilated area |
| **P272** | Contaminated work clothing should not be allowed out of the workplace |
| **P273** | Avoid release to the environment |
| **P280** | Wear protective gloves/protective clothing/eye protection/face protection |
| **P302+P352** | IF ON SKIN: Wash with plenty of water |
| **P304+P340** | IF INHALED: Remove person to fresh air and keep comfortable for breathing |
| **P308+P313** | IF exposed or concerned: Get medical advice/attention |
| **P311** | Call a POISON CENTER or doctor/physician |
| **P314** | Get medical advice/attention if you feel unwell |
| **P321** | Specific treatment |
| **P333+P313** | If skin irritation or rash occurs: Get medical advice/attention |

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| | |
|---|---|
| **P362+P364** | Take off contaminated clothing |
| **P391** | Collect spillage |
| **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 |
| **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 (10.11.2026)** | 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: 2026-11-10.

[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: 2026-11-10.

[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: 2026-11-10.

[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: 2026-11-10.

[5] ISO. ISO 7010:2019 — Graphical symbols. Safety signs. URL: https://www.iso.org/standard/72424.html Accessed: 2026-11-10.

[6] ISO. ISO 3864-1:2011 — Safety colours and safety signs. URL: https://www.iso.org/standard/51021.html Accessed: 2026-11-10.

[7] PubChem. National Center for Biotechnology Information (NIH/NLM), chemical compound database. URL: https://pubchem.ncbi.nlm.nih.gov/compound/25199732

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

[9] 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

[10] 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

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


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[12] Act of 26 June 1974 — Labour Code (Poland), Art. 176 § 1. Journal of Laws 2023 item 1465. URL: https://isap.sejm.gov.pl

[13] Council of Ministers of the Republic of Poland. Regulation of 3 April 2017 on the list of arduous, hazardous or health-harmful work for pregnant and breastfeeding women. Journal of Laws 2017 item 796. URL: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20170000796

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

[15] 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: 2026-11-10.

## External links

NIST: https://webbook.nist.gov/cgi/cbook.cgi?ID=12035-72-2

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




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**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: 10.11.2026 | Document version: 6

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