

## SAFETY DATA SHEET (SDS)

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

Date: 23.09.2026 | Version: 1 | EN

## ethanol

ethanol

MOLAR MASS

46.07

LOGP

-0.31

CAS 64-17-5

C<sub>2</sub>H<sub>6</sub>O

EC 200-578-6

## HAZARD CLASSIFICATION (GHS / CLP)



Danger

H225

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    | ethanol                                        |
| 1.1 IUPAC name        | ethanol                                        |
| 1.1 CAS number        | 64-17-5                                        |
| 1.1 EC number         | 200-578-6                                      |
| 1.1 PubChem CID       | 702                                            |
| 1.1 InChIKey          | LFQSCWFLJHTTHZ-UHFFFAOYSA-N                    |
| 1.1 SMILES            | CCO                                            |
| 1.1 Molecular formula | C <sub>2</sub> H <sub>6</sub> O <sup>[7]</sup> |
| 1.1 Molar mass        | 46.07 g/mol <sup>[7]</sup>                     |
| 1.1 Exact mass        | 46.0419 Da <sup>[7]</sup>                      |

## 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 +48 42 631 47 24

Toxicological Information Centre (CIT), Łódź — available 24/7

## 2. Hazards identification

GHS:



PPE:



Prohibitions:



**Danger**

### Hazard statements (H) <sup>[3][4][11]</sup>

**H225** Highly flammable liquid and vapour

### Precautionary statements (P) <sup>[3][4][11]</sup>

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

**P210 — TRZYMAJ Z DAŁA OD ŹRÓDEŁ CIEPŁA** —

**P233** Keep container tightly closed

**P240** Ground and bond container and receiving equipment

**P241** Use explosion-proof electrical/ventilating/lighting equipment

**P280** Wear protective gloves/protective clothing/eye protection/face protection

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

**P370+P378** In case of fire: Use appropriate media to extinguish

**P403+P235** Store in a well-ventilated place: Keep cool

**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.**

### 3. Composition/information on ingredients

|                   |                                                                                       |
|-------------------|---------------------------------------------------------------------------------------|
| Substance type    | pure substance                                                                        |
| CAS Number        | 64-17-5                                                                               |
| EC number         | 200-578-6                                                                             |
| Molecular formula | C <sub>2</sub> H <sub>6</sub> O                                                       |
| Concentration     | ≥99% (typical reagent-grade purity — to be confirmed by the supplier's specification) |
| Clp index no      | 603-002-00-5                                                                          |

### 4. First aid measures



#### Inhalation

Move the affected person to fresh air. Keep at rest. If not breathing: artificial respiration (qualified personnel only). <sup>[1][2][15]</sup>

#### Skin contact

Remove contaminated clothing. Rinse skin with soap and water (min. 15 minutes). <sup>[1][2][15]</sup>

#### Eye contact

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

#### Ingestion

Do NOT induce vomiting (unless directed by a physician). Rinse mouth with water. Never give anything by mouth to an unconscious person. Poison Centre Łódź: +48 42 631 47 24 (24/7). Emergency number: 112. <sup>[1][2][15]</sup>

#### Symptoms and effects

No specific symptoms described in the literature. <sup>[3][11]</sup>

#### 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).**

### 5. Firefighting measures

|                                |                                                                                                                         |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Suitable extinguishing media   | Alcohol-resistant foam, carbon dioxide (CO <sub>2</sub> ), dry chemical powder, water spray/mist. <sup>[1][2][15]</sup> |
| Unsuitable extinguishing media | Full/compact water jet (splashes and spreads the burning liquid, which floats on water). <sup>[1][2][15]</sup>          |
| Specific hazards               | Thermal decomposition products: CO, CO <sub>2</sub> . <sup>[16]</sup>                                                   |
| Advice for firefighters        | Use self-contained breathing apparatus (SCBA). Full protective suit. <sup>[1][2][15]</sup>                              |
| Flash Point                    | 13°C <sup>[9]</sup>                                                                                                     |
| Auto-ignition temperature      | 363°C <sup>[9]</sup>                                                                                                    |

### 6. Accidental release measures

|                                         |                                                                                                                                                                                                                                                    |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Personal precautions                    | Use personal protective equipment (see Section 8). Avoid breathing vapours. <sup>[1][2][15]</sup>                                                                                                                                                  |
| Environmental precautions               | Prevent entry into sewers, groundwater and surface water. <sup>[1][2][15]</sup>                                                                                                                                                                    |
| Methods for containment and cleaning up | Contain the spill with a barrier. Absorb with inert material (sand, vermiculite, diatomaceous earth). Collect into sealed, labelled containers. Do not release into drains. Remove ignition sources; use non-sparking tools. <sup>[1][2][15]</sup> |
| 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. <sup>[1][2][15]</sup> |
|-------------|--------------------------------------------------------------------------------------------------------------------------|

|                               |                                                                                         |
|-------------------------------|-----------------------------------------------------------------------------------------|
| <b>Storage temperature</b>    | Store at room temperature (15-25°C) or as indicated on the label. <sup>[1][2][15]</sup> |
| <b>Humidity</b>               | Store in a dry place (<60% RH). <sup>[1][2][15]</sup>                                   |
| <b>Light</b>                  | Protect from direct sunlight. <sup>[1][2][15]</sup>                                     |
| <b>Incompatible materials</b> | Strong oxidizers, Ignition sources, open flames. <sup>[16]</sup>                        |

## 8. Exposure controls/personal protection

### 8.1 Control parameters

|                           |                                                                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OEL — NDS (Poland)</b> | NDS = 1900 mg/m <sup>3</sup> (TWA) — Rozp. MRiPS Dz.U.2024 poz.1017 <sup>[24]</sup>                                                            |
| <b>OEL (EU)</b>           | 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. |
| <b>DNEL</b>               | No data available.                                                                                                                             |
| <b>PNEC</b>               | No data available.                                                                                                                             |

### 8.2 Personal protective equipment (PPE) <sup>[5][6][17]</sup>



**Chemical-resistant protective gloves**  
EN ISO 374-1:2016+A1:2018  
nitrile (min. 0.11 mm)



**Closed safety spectacles or goggles**  
EN ISO 16321-1:2022 / EN 166:2001



**Closed safety footwear with toe protection**  
EN ISO 20345:2022 (S2/S3)

## 9. Physical and chemical properties

| Property (item 9.1)                                | Value                                       | Source |
|----------------------------------------------------|---------------------------------------------|--------|
| <b>Physical state</b>                              | Liquid                                      |        |
| <b>Colour</b>                                      | No data available.                          |        |
| <b>Odour</b>                                       | No data available.                          |        |
| <b>pH (1% aqueous solution)</b>                    | No data available.                          |        |
| <b>Melting point</b>                               | -114.14°C <sup>[8][22]</sup>                |        |
| <b>Boiling point</b>                               | 78.4°C <sup>[8][22]</sup>                   |        |
| <b>Flash point</b>                                 | 13°C <sup>[9][22]</sup>                     |        |
| <b>Flammability</b>                                | Flam. Liq. 2 (H225) <sup>[3][11]</sup>      |        |
| <b>Lower and upper explosion limit</b>             | 3.1–27.7 % obj. <sup>[22]</sup>             |        |
| <b>Density (20°C)</b>                              | 0.7893 g/cm <sup>3</sup> <sup>[9][22]</sup> |        |
| <b>Vapour pressure</b>                             | 7.9 kPa (59.3 mmHg, 25°C) <sup>[9]</sup>    |        |
| <b>Relative vapour density</b>                     | 1.59 <sup>[21]</sup>                        |        |
| <b>Dynamic viscosity</b>                           | 1.074 mPa·s <sup>[9]</sup>                  |        |
| <b>Kinematic viscosity</b>                         | No data available.                          |        |
| <b>Refractive index n<sub>D</sub><sup>20</sup></b> | 1.3614                                      |        |
| <b>Auto-ignition temperature</b>                   | 363°C <sup>[9]</sup>                        |        |
| <b>Decomposition temperature</b>                   | Not applicable                              |        |

| Property (item 9.1)                               | Value                                                  | Source |
|---------------------------------------------------|--------------------------------------------------------|--------|
| Surface Tension                                   | 22.1 mN/m <sup>[9]</sup>                               |        |
| Rozpuszcz. w wodzie                               | Miscible with water in all proportions. <sup>[9]</sup> |        |
| Particle characteristics                          | Not applicable (REACH 9.1(r))                          |        |
| Partition coefficient n-octanol/water (log value) | -0.31 <sup>[9][23]</sup>                               |        |
| Molar mass                                        | 46.07 g/mol <sup>[7]</sup>                             |        |
| Molecular formula                                 | C <sub>2</sub> H <sub>6</sub> O <sup>[7]</sup>         |        |
| 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     | 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, Ignition sources, open flames.      |
| Decomposition products | Thermal decomposition products: CO, CO <sub>2</sub> . |

## 11. Toxicological information

|                                       |                                                                                                                                                             |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LD50 (oral)                           | 7060 mg/kg (rat) <sup>[10][11]</sup>                                                                                                                        |
| LD50 (dermal)                         | No data available.                                                                                                                                          |
| LC50 (inhalation)                     | LC50 20000 ppm (10 h) (rat) <sup>[7]</sup>                                                                                                                  |
| Skin irritation                       | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) <sup>[3][11]</sup> |
| Eye irritation                        | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) <sup>[3][11]</sup> |
| Sensitisation                         | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) <sup>[3][11]</sup> |
| Mutagenicity                          | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) <sup>[3][11]</sup> |
| Carcinogenicity                       | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) <sup>[3][11]</sup> |
| 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) <sup>[3][11]</sup> |
| STOT — single exposure                | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) <sup>[3][11]</sup> |
| STOT — repeated exposure              | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) <sup>[3][11]</sup> |
| Aspiration hazard                     | Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) <sup>[3][11]</sup> |

## 12. Ecological information

|                                        |                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Aquatic toxicity</b>                | LC <sub>50</sub> (fish): 1350 mg/L (Oryzias latipes, 48 h). EC <sub>50</sub> (Daphnia): 7640 mg/L (Daphnia magna, 48 h). EC <sub>50</sub> (algae): 17.9 mg/L (Ulva pertusa, 96 h) <sup>[20]</sup>                                                                                                                                       |
| <b>Persistence / biodegradability</b>  | No data available.                                                                                                                                                                                                                                                                                                                      |
| <b>Bioaccumulative potential</b>       | log Kow = -0.31 <sup>[9]</sup> . Low bioaccumulation potential (log Kow < 4.5 — PBT/vPvB screening criterion per ECHA Guidance R.11). <sup>[18][19]</sup>                                                                                                                                                                               |
| <b>Mobility in soil</b>                | No data available.                                                                                                                                                                                                                                                                                                                      |
| <b>PBT/vPvB assessment</b>             | Insufficient data to assess PBT/vPvB.                                                                                                                                                                                                                                                                                                   |
| <b>Endocrine disrupting properties</b> | Zgłoszone efekty na układ hormonalny w badaniach na zwierzętach (dane ekotoksykologiczne, US EPA ECOTOX; nie stanowią regulacyjnej klasyfikacji ED wg 2018/605). Zgłoszone efekty endokrynne u organizmów wodnych (dane ekotoksykologiczne, US EPA ECOTOX; nie stanowią regulacyjnej klasyfikacji ED wg 2018/605). [PL] <sup>[20]</sup> |

## 13. Disposal considerations

|                         |                                                                                                                                                               |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Disposal method</b>  | Hand over for disposal to licensed contractors in accordance with national and local regulations. Do not discharge into sewers.                               |
| <b>Waste code (EWC)</b> | 16 05 06* — Laboratory and analytical chemicals (np. chemical reagents) zawierające substancje niebezpieczne. EWC code verification required. <sup>[14]</sup> |
| <b>Packaging</b>        | Cleaned packaging may be recycled. Contaminated packaging must be treated as hazardous waste.                                                                 |

## 14. Transport information



Class 3 — Flammable liquids

|                               |                                                                                                                                                                                        |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>UN number</b>              | UN 1170 <sup>[13]</sup>                                                                                                                                                                |
| <b>Proper shipping name</b>   | Ethanol or ethanol solution <sup>[13]</sup>                                                                                                                                            |
| <b>Transport hazard class</b> | 3 <sup>[13]</sup>                                                                                                                                                                      |
| <b>Packing Group</b>          | II <sup>[13]</sup>                                                                                                                                                                     |
| <b>Environmental hazard</b>   | Not classified as environmentally hazardous for transport (no H400/H410/H411 in CLP Annex VI; no marine pollutant mark required) <sup>[3]</sup>                                        |
| <b>Special precautions</b>    | Handle as dangerous goods according to the assigned class (ADR/IMDG/IATA); apply the precautions appropriate to that class.                                                            |
| <b>CN/HS code</b>             | CN/HS code: verification required in the Eurostat Combined Nomenclature.                                                                                                               |
| <b>Notes</b>                  | 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. <sup>[13]</sup> |

## 15. Regulatory information

|                        |                                                                                                                                       |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>SVHC status</b>     | SVHC status not verified against the available dataset — check the current ECHA Candidate List; do not assume absence. <sup>[1]</sup> |
| <b>REACH Annex XIV</b> | Not verified against the ECHA Authorisation List — check REACH Annex XIV. <sup>[1]</sup>                                              |

## 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 23.09.2026 were omitted as future (not yet applicable).

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

### Scientific citations (10)

Toxicology and carcinogenesis. Studies of urethane, ethanol, and urethane/ethanol (urethane, CAS No. 51-79-6; ethanol, CAS No. 64-17-5) in B6C3F1 mice (drinking water studies).. (2004).

Jerlhag E. GLP-1 and Alcohol-Related Behaviors: Insights From Preclinical Studies.. Biological psychiatry (2026). DOI: 10.1016/j.biopsych.2026.04.022

Pender SC, Beryozza M, Khodoruth WNC et al.. Epigenetic pathways linking prenatal alcohol exposure to fetal alcohol spectrum disorder.. Neuroscience and biobehavioral reviews (2026). DOI: 10.1016/j.neubiorev.2026.106868

Cibin I, Spaepen S, Steensels J et al.. Next-generation brewing yeasts for non-alcoholic beers.. Current opinion in biotechnology (2026). DOI: 10.1016/j.copbio.2026.103525

Krag A, Åberg F, Mellinger J et al.. Alcohol-Related Liver Disease: A Review.. JAMA (2026). DOI: 10.1001/jama.2026.12038

### Full text of H statements

**H225** Highly flammable liquid and vapour

### Full text of P statements

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

**P210 — TRZYMAJ Z DALA OD ŹRÓDEŁ CIEPŁA** —

**P233** Keep container tightly closed

**P240** Ground and bond container and receiving equipment

**P241** Use explosion-proof electrical/ventilating/lighting equipment

**P280** Wear protective gloves/protective clothing/eye protection/face protection

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

**P370+P378** In case of fire: Use appropriate media to extinguish

**P403+P235** Store in a well-ventilated place: Keep cool

**P501** Dispose of contents/container to an approved waste collection point

### Abbreviations

|             |                                                                                     |
|-------------|-------------------------------------------------------------------------------------|
| <b>ADR</b>  | European Agreement concerning the International Carriage of Dangerous Goods by Road |
| <b>ATE</b>  | Acute Toxicity Estimate                                                             |
| <b>CAS</b>  | Chemical Abstracts Service                                                          |
| <b>CLP</b>  | Classification, Labelling and Packaging (Reg. (EC) 1272/2008)                       |
| <b>CMR</b>  | Carcinogenic, Mutagenic, toxic to Reproduction                                      |
| <b>DNEL</b> | Derived No-Effect Level                                                             |
| <b>EC</b>   | European Community number                                                           |
| <b>EPI</b>  | Personal protective equipment                                                       |
| <b>GHS</b>  | Globally Harmonized System                                                          |
| <b>IATA</b> | International Air Transport Association                                             |
| <b>IMDG</b> | International Maritime Dangerous Goods Code                                         |
| <b>SDS</b>  | Safety Data Sheet                                                                   |
| <b>LC50</b> | Lethal Concentration, 50%                                                           |

|              |                                                                                            |
|--------------|--------------------------------------------------------------------------------------------|
| <b>LD50</b>  | Lethal Dose, 50%                                                                           |
| <b>NDS</b>   | Maximum admissible concentration (workplace, PL)                                           |
| <b>NDSCh</b> | Short-term exposure limit (PL)                                                             |
| <b>OEL</b>   | Occupational Exposure Limit                                                                |
| <b>PBT</b>   | Persistent, Bioaccumulative and Toxic                                                      |
| <b>PNEC</b>  | Predicted No-Effect Concentration                                                          |
| <b>REACH</b> | Registration, Evaluation, Authorisation and Restriction of Chemicals (Reg. (EC) 1907/2006) |
| <b>STOT</b>  | Specific Target Organ Toxicity                                                             |
| <b>SVHC</b>  | Substance of Very High Concern                                                             |
| <b>TPSA</b>  | Topological Polar Surface Area                                                             |
| <b>vPvB</b>  | very Persistent and very Bioaccumulative                                                   |

## Version history

**v1 (23.09.2026)** 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: 2026-09-23.
- [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: 2026-09-23.
- [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: 2026-09-23.
- [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: 2026-09-23.
- [5] ISO. ISO 7010:2019 — Graphical symbols. Safety signs. URL: <https://www.iso.org/standard/72424.html> Accessed: 2026-09-23.
- [6] ISO. ISO 3864-1:2011 — Safety colours and safety signs. URL: <https://www.iso.org/standard/51021.html> Accessed: 2026-09-23.
- [7] PubChem. National Center for Biotechnology Information (NIH/NLM), chemical compound database. URL: <https://pubchem.ncbi.nlm.nih.gov/compound/702>
- [8] NIST. Chemistry WebBook, SRD 69. National Institute of Standards and Technology. URL: <https://webbook.nist.gov/cgi/cbook.cgi?ID=64-17-5>
- [9] Yaws, C.L. Thermophysical Properties of Chemicals and Hydrocarbons. 2nd ed. Amsterdam: Elsevier (Gulf Professional Publishing), 2014.
- [10] NIOSH. Registry of Toxic Effects of Chemical Substances (RTECS). Cincinnati: NIOSH. URL: <https://www.cdc.gov/niosh/rtecs>
- [11] ECHA. European Chemicals Agency — harmonised classification inventory (CLP Annex VI). URL: <https://echa.europa.eu>
- [12] ECHA. REACH Registration Dossier (registered substance, acute toxicity study record). Helsinki: European Chemicals Agency. URL: <https://echa.europa.eu/registration-dossier>
- [13] 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>
- [14] 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>
- [15] 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](https://echa.europa.eu/documents/10162/2324906/sds_en.pdf)
- [16] Urban, P.G., ed. Bretherick's Handbook of Reactive Chemical Hazards. 8th ed. Oxford: Academic Press.
- [17] CEN. Personal protective equipment standards (EN ISO 374-1, EN 166, EN 149, EN 14387, EN ISO 20345). Brussels: European Committee for Standardization.
- [18] 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>
- [19] 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>
- [20] U.S. EPA. ECOTOX Knowledgebase. Washington, DC: U.S. Environmental Protection Agency. URL: <https://cfpub.epa.gov/ecotox/>
- [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] DECHEMA, PTB, and BAM. CHEMSAFE - Database of Evaluated Safety Characteristics for the Avoidance of Explosions. Frankfurt am Main: DECHEMA e.V.; Braunschweig/Berlin: Physikalisch-Technische Bundesanstalt and Bundesanstalt für Materialforschung und -prüfung. URL: <https://www.chemsafe.ptb.de>
- [23] Sangster, J. "Octanol-Water Partition Coefficients of Simple Organic Compounds." Journal of Physical and Chemical Reference Data 18, no. 3 (1989): 1111-1229. URL: <https://doi.org/10.1063/1.555833>
- [24] 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: 2026-09-23.

## External links

NIST: <https://webbook.nist.gov/cgi/cbook.cgi?ID=64-17-5>  
 Wikidata: <https://www.wikidata.org/wiki/Q153>  
 ChEMBL: [https://www.ebi.ac.uk/chembl/compound\\_report\\_card/CHEMBL545](https://www.ebi.ac.uk/chembl/compound_report_card/CHEMBL545)



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**Author:** [www.MolGod.org](http://www.MolGod.org) — platform for automated safety data sheets (SDS).

Issue date: 23.09.2026 | Document version: 1

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