

SAFETY DATA SHEET (SDS)

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

Date: 03.09.2026 | Version: 1 | EN

butanone; ethyl methyl ketone

butan-2-one

CAS 78-93-3

C₄H₈O

EC 201-159-0

MOLAR MASS
72.11LOGP
0.29

HAZARD CLASSIFICATION (GHS / CLP)



Danger

H225 H319 H336 EUH066

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	butanone; ethyl methyl ketone
1.1 IUPAC name	butan-2-one
1.1 CAS number	78-93-3
1.1 EC number	201-159-0
1.1 PubChem CID	6569
1.1 InChIKey	ZWEHNKRNPOVVGH-UHFFFAOYSA-N
1.1 SMILES	CCC(=O)C
1.1 Molecular formula	C ₄ H ₈ O ^[7]
1.1 Molar mass	72.11 g/mol ^[7]
1.1 Exact mass	72.0575 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)

2. Hazards identification



Danger

Hazard statements (H) [3][4][10]

H225	Highly flammable liquid and vapour
H336	May cause drowsiness or dizziness
H319	Causes serious eye irritation
EUH066	Repeated exposure may cause skin dryness or cracking.

Precautionary statements (P) [3][4][10]

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P233	Keep container tightly closed
P240	Ground and bond container and receiving equipment
P261	Avoid breathing 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
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
P312	Call a POISON CENTER or doctor/physician if you feel unwell
P337+P313	If eye irritation persists: Get medical advice/attention
P370+P378	In case of fire: Use appropriate media to extinguish
P403+P235	Store in a well-ventilated place: Keep cool
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.

3. Composition/information on ingredients

Substance type	pure substance
CAS Number	78-93-3
EC number	201-159-0
Molecular formula	C ₄ H ₈ O
Concentration	≥99% (typical reagent-grade purity — to be confirmed by the supplier's specification)
Clp index no	606-002-00-3

4. First aid measures



Inhalation

Move the affected person to fresh air. Keep at rest. 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). ^{[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. Poison Centre Łódź: +48 42 631 47 24 (24/7). Emergency number: 112. ^{[1][2][16]}

Symptoms and effects

cough, shortness of breath, headache, dizziness; eye irritation and watering. ^{[3][10]}

Notes for physician

Requires verification

Emergency numbers: CIT Łódź: +48 42 631 47 24 (24/7) | Emergency: 112

5. Firefighting measures

Suitable extinguishing media	Alcohol-resistant foam, carbon dioxide (CO ₂), dry chemical powder, water spray/mist. ^{[1][2][16]}
Unsuitable extinguishing media	Full/compact water jet (splashes and spreads the burning liquid, which floats on water). ^{[1][2][16]}
Specific hazards	Thermal decomposition products: CO, CO ₂ . ^[17]
Advice for firefighters	Use self-contained breathing apparatus (SCBA). Full protective suit. ^{[1][2][16]}
Flash Point	-9°C ^[7]
Auto-ignition temperature	516.1°C ^[7]

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	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. ^{[1][2][16]}
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][16]}
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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, Ignition sources, open flames. ^[17]

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][18]}

 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	 Respiratory protection EN 14387:2004+A1:2008 type A2 filter (organic vapours)	 Closed safety footwear with toe protection EN ISO 20345:2022 (S2/S3)
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9. Physical and chemical properties

Property (item 9.1)	Value	Source
Physical state	Liquid	
Colour	No data available.	
Odour	No data available.	
pH (1% aqueous solution)	No data available.	
Melting point	-86.65°C ^{[8] [7][23]}	
Boiling point	79.7987°C ^{[8] [7][23]}	
Flash point	-9°C (experimental data) ^[7]	
Flammability	Flam. Liq. 2 (H225) ^{[3][10]}	
Lower and upper explosion limit	1.5–13.4 % obj. ^[23]	
Density (20°C)	0.806 g/cm ³ ^[7]	
Vapour pressure	10.332 kPa (77.5 mmHg, 20°C) ^{[7][24]}	
Relative vapour density	2.49 ^[22]	
Dynamic viscosity	0.4 mPa·s ^[7]	
Kinematic viscosity	No data available.	
Refractive index n_D²⁰	1.3788 (experimental data) ^[7]	
Auto-ignition temperature	516.1°C (experimental data) ^[7]	

Property (item 9.1)	Value	Source
Decomposition temperature	Not applicable	
Surface Tension	24 mN/m ^[9]	
Rozpuszcz. w wodzie	223 g/L, 25°C ^[7]	
Particle characteristics	Not applicable (REACH 9.1(r))	
Partition coefficient n-octanol/water (log value)	0.29 ^[25]	
Molar mass	72.11 g/mol ^[7]	
Molecular formula	C ₄ H ₈ O ^[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	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, CO2.

11. Toxicological information

LD50 (oral)	LD50 3400 mg/kg (rat, oral) ^[7]
LD50 (dermal)	No data available.
LC50 (inhalation)	LC50 23500 mg/m3 (8 h); >5000 ppm (6 h) (rat) ^[7]
Skin irritation	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][10]}
Eye irritation	Category 2 — eye irritation.
Sensitisation	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][10]}
Mutagenicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][10]}
Carcinogenicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][10]}
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][10]}
STOT — single exposure	Category 3 (H336): May cause drowsiness or dizziness. ^{[3][10]}
STOT — repeated exposure	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][10]}
Aspiration hazard	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) ^{[3][10]}

12. Ecological information

Aquatic toxicity	LC ₅₀ (fish): 3220 mg/L (Pimephales promelas, 96 h). EC ₅₀ (Daphnia): 5091 mg/L (Daphnia magna, 48 h) ^[21]
Persistence / biodegradability	No data available.
Bioaccumulative potential	log Kow = 0.29. 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 (np. chemical reagents) zawierające substancje niebezpieczne. EWC code verification required. ^[15]
Packaging	Cleaned packaging may be recycled. Contaminated packaging must be treated as hazardous waste.

14. Transport information



Class 3 — Flammable liquids

UN number	UN 1193 ^[14]
Proper shipping name	ETHYL METHYL KETONE ^[14]
Transport hazard class	3 — Flammable liquids ^[14]
Packing Group	II ^[14]
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	CN/HS code: verification required in the Eurostat Combined Nomenclature.
Notes	Towar niebezpieczny ADR (H225).

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]

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 03.09.2026 were omitted as future (not yet applicable).

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

Scientific citations (10)

- Api AM, Belmonte F, Belsito D et al.. RIFM fragrance ingredient safety assessment, 2-butanone, CAS Registry Number 78-93-3.. Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association (2019). DOI: 10.1016/j.fct.2019.111025
- Matt Nagle, Susan Price, Antonia Trotta et al.. Analysis of in-vivo skin anisotropy using elastic wave measurements and Bayesian modelling. arXiv (2506.02248v1) (2025). DOI: 10.1007/s10439-023-03185-2
- Le Danvic C, Gérard O, Sellem E et al.. Enhancing bull sexual behavior using estrus-specific molecules identified in cow urine.. Theriogenology (2015). DOI: 10.1016/j.theriogenology.2015.02.004
- Oral Presentations (pp. 78–93). Annals of Nutrition and Metabolism (2009). DOI: 10.1159/000248277
- Cosnier F, Grossmann S, Nunge H et al.. Metabolism of inhaled methylethylketone in rats.. Drug and chemical toxicology (2018). DOI: 10.1080/01480545.2017.1289220

Full text of H statements

H225	Highly flammable liquid and vapour
H336	May cause drowsiness or dizziness
H319	Causes serious eye irritation
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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

v1 (03.09.2026) 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: 2026-09-03.
- [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: 2026-09-03.
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- [6] ISO. ISO 3864-1:2011 — Safety colours and safety signs. URL: <https://www.iso.org/standard/51021.html> Accessed: 2026-09-03.
- [7] PubChem. National Center for Biotechnology Information (NIH/NLM), chemical compound database. URL: <https://pubchem.ncbi.nlm.nih.gov/compound/6569>
- [8] NIST. Chemistry WebBook, SRD 69. National Institute of Standards and Technology. URL: <https://webbook.nist.gov/cgi/cbook.cgi?ID=78-93-3>
- [9] Reid, R.C., Prausnitz, J.M., Poling, B.E. The Properties of Gases and Liquids. 4th ed. New York: McGraw-Hill, 1987.
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- [14] 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>
- [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.
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- [22] 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>
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- [26] 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: 2026-09-03.

External links

NIST: <https://webbook.nist.gov/cgi/cbook.cgi?ID=78-93-3>

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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Author: www.MolGod.org — platform for automated safety data sheets (SDS).

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