

Chemical Safety Data Sheet MSDS / SDS

Acetaminophen

Revision Date:2024-06-15 Revision Number:1

SECTION 1: Identification of the substance/mixture

Product identifier

Product name : Acetaminophen
CBnumber : CB1413658
CAS : 103-90-2
EINECS Number : 203-157-5
Synonyms : Paracetamol,Acetaminophen

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.
Uses advised against : none

SECTION 2: Hazards identification

Classification of the substance or mixture

Acute toxicity - Category 4, Oral

Label elements

Pictogram(s)

□□□□

Signal word : Danger

Hazard statement(s)

H225 Highly Flammable liquid and vapour
H302 Harmful if swallowed
H315 Causes skin irritation
H317 May cause an allergic skin reaction
H319 Causes serious eye irritation
H335 May cause respiratory irritation
H341 Suspected of causing genetic defects
H370 Causes damage to organs

H371 May cause damage to organs

H372 Causes damage to organs through prolonged or repeated exposure

H373 May cause damage to organs through prolonged or repeated exposure

H402 Harmful to aquatic life

H411 Toxic to aquatic life with long lasting effects

H412 Harmful to aquatic life with long lasting effects

Precautionary statement(s)

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 Wash hands thoroughly after handling.

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.

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

P311 Call a POISON CENTER or doctor/physician.

P330 Rinse mouth.

P391 Collect spillage. Hazardous to the aquatic environment

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

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P307+P311 IF exposed: call a POISON CENTER or doctor/physician.

P405 Store locked up.

P501 Dispose of contents/container to.....

Prevention

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

Response

P301+P317 IF SWALLOWED: Get medical help.

P330 Rinse mouth.

Storage

none

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: Acetaminophen
Synonyms	: Paracetamol, Acetaminophen
CAS	: 103-90-2
EC number	: 203-157-5
MF	: C ₈ H ₉ NO ₂
MW	: 151.16

SECTION 4: First aid measures

Description of first aid measures

If inhaled

Fresh air, rest.

Following skin contact

Rinse and then wash skin with water and soap.

Following eye contact

Rinse with plenty of water (remove contact lenses if easily possible).

Following ingestion

Give one or two glasses of water to drink.

Most important symptoms and effects, both acute and delayed

SYMPTOMS: Symptoms of overexposure to this compound include nausea, vomiting, cyanosis from methemoglobinemia, injury to the liver, kidneys, central nervous system and heart, circulatory collapse, drowsiness, confusion, liver tenderness, low blood pressure, cardiac arrhythmias, jaundice, acute renal failure, death due to liver necrosis, metabolic acidosis, hepatic damage and cirrhosis. Other symptoms include changes in exocrine pancreas, diarrhea, irritability, somnolence, general anesthesia, fever and hepatitis. Diaphoresis and general malaise may occur. Exposure may lead to hematological reactions and, occasionally, skin rashes and other allergic reactions. The rash is usually erythematous or urticarial, but sometimes it is more serious and may be accompanied by drug fever and mucosal lesions. Exposure to large amounts may lead to pallor, anorexia, abdominal pain, abnormalities of glucose metabolism and hepatic encephalopathy. It may also lead to epigastric pain, sweating, paresthesias of distal extremities, muscular aching, weakness, dizziness, central nervous system depression (rare), pain in the upper right quadrant, enlarged liver, oliguria, anuria, coagulation defects and cardiomyopathy characterized by ST segment abnormalities, T-wave flattening and pericarditis. This compound can cause purpura, generalized bleeding and hypoglycemia. It can also cause neutropenia, pancytopenia, leukopenia, thrombocytopenia and nephrotoxicity. Other symptoms may include wheezing, general discomfort, blood changes including many anemias (aplastic anemia), central nervous system stimulation, swollen tongue, rapid pulse, skin eruptions, chills, excitement, delirium, vascular collapse and convulsions. Irritation of the skin, eyes, mucous membranes and upper respiratory tract may occur. **ACUTE/CHRONIC HAZARDS:** This compound may be harmful by ingestion and inhalation. It may cause irritation of the skin, eyes, mucous membranes and upper respiratory tract. When heated to decomposition it emits toxic fumes of carbon monoxide, carbon dioxide and nitrogen oxides. (NTP, 1992)

Indication of any immediate medical attention and special treatment needed

Emergency and supportive measures. Spontaneous vomiting may delay the oral administration of antidote or charcoal and can be treated with metoclopramide or a serotonin receptor antagonist such as ondansetron. Provide general supportive care for hepatic or renal failure if it occurs. Emergency liver transplant may be necessary for fulminant hepatic failure. Encephalopathy, metabolic acidosis, hypoglycemia, and a progressive rise in the prothrombin time are indications of severe liver injury.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Special protective equipment for firefighters: Wear self contained breathing apparatus for fire fighting if necessary.

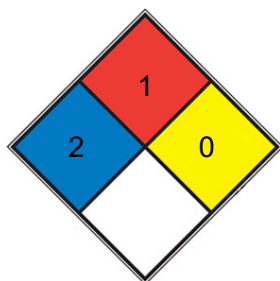
Specific Hazards Arising from the Chemical

Flash point data for this chemical are not available; however, it is probably combustible. (NTP, 1992)

Advice for firefighters

Use powder, alcohol-resistant foam, water spray, carbon dioxide.

NFPA 704



HEALTH 2 Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. [diethyl ether](#), ammonium phosphate, iodine)

FIRE 1 Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Includes some finely divided suspended solids that do not require heating before ignition can occur. Flash point at or above 93.3 °C (200 °F). (e.g. [mineral oil](#), ammonia)

REACT 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium, [N2](#))

SPEC.

HAZ.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Do NOT let this chemical enter the environment.

Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Do NOT let this chemical enter the environment.

Methods and materials for containment and cleaning up

Personal precautions: Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided. Methods and materials for containment and cleaning up: Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access. Keep container tightly closed in a dry and well-ventilated place. Keep in a dry place.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	Paracetamol			
CAS No.	103-90-2			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m³	ppm	mg/m³
Ireland	?	10	?	?
United Kingdom	?	10	?	?
	Remarks			

Biological limit values

no data available

Exposure controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures

Eye/face protection

Wear safety goggles.

Skin protection

Protective gloves.

Respiratory protection

Use local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	Crystals or Crystalline Powder
Colour	White
Odour	Odorless
Melting point/freezing point	165.5 °C. Atm. press.:966 hPa. Remarks:Other details not available.
Boiling point or initial boiling point and boiling range	273 °C. Atm. press.:966 hPa. Remarks:Other details not available.
Flammability	Combustible.
Lower and upper explosion limit/flammability limit	15%(V)
Flash point	177 °C. Atm. press.:966 hPa.
Auto-ignition temperature	Atm. press.:966 hPa. Remarks:Paracetamol did not catch fire on being exposed to air at room temperature of 26 degC.
Decomposition temperature	no data available
pH	5.5-6.5 (H ₂ O, 20°C)(saturated solution)
Kinematic viscosity	no data available
Solubility	ethanol: soluble0.5M, clear, colorless
Partition coefficient n-octanol/water	log Pow = 0.46. Temperature:25 °C. Remarks:PH not available.
Vapour pressure	0.008 Pa. Temperature:25 °C.
Density and/or relative density	0.679 g/cm ³ . Temperature:26 °C.
Relative vapour density	(air = 1): 5.2
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

Slightly soluble in water.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

Not flammable or combustible.4-HYDROXYACETANILIDE is sensitive to light. Incompatible with strong oxidizers. (NTP, 1992).

Conditions to avoid

no data available

Incompatible materials

Oxidizing agents

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx).

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 - mouse (female) - 338 mg/kg bw.
- Inhalation: LC50 - mouse - 33 900 mg/m³ air.
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Evaluation: There is inadequate evidence in humans for the carcinogenicity of paracetamol. There is inadequate evidence in experimental animals for the carcinogenicity of paracetamol. Overall evaluation: Paracetamol is not classifiable as to its carcinogenicity to humans (Group 3).

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

Ingestion may cause effects on the kidneys and liver. This may result in impaired functions.

Aspiration hazard

A nuisance-causing concentration of airborne particles can be reached quickly.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - Pimephales promelas - 814 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia pulex - 136 mg/L - 24 h.

Toxicity to algae: EC50 - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum) - 134 mg/L - 72 h.

Toxicity to microorganisms: IGC50 - Tetrahymena pyriformis - 999 mg/L - 48 h.

Persistence and degradability

AEROBIC: Acetaminophen has been categorized as readily biodegradable following acclimation(1). A half-life of 20 days has been reported for acetaminophen using an activated sludge inoculum(2). Half-lives of 40 and 17 days were observed when using activated sludge inoculums acclimated to phenol(3) and cresol(4), respectively. Acetaminophen reached 94% of its theoretical BOD in 6 days using an activated sludge inoculum and the Zahn-Wellens test(5). The rate constants for non-adapted, phenol-adapted, and cresol-adapted activated sludge (sludge concentrations of 500, 10, and 50 mg/L) were 0.141×10^{-2} , 0.713×10^{-3} , and 0.215×10^{-2} 1/hr, respectively(6); half-lives are 21, 40, and 13 days, respectively(SRC). Acetaminophen, present at 100 ug/L, exhibited biodegradation rates of 0.014/hr and 0.00051/hr in 5 days using Tamlya and Tsumeta River water (Japan), respectively, and the OECD 301-A river die-away test. The corresponding half-lives are 50 and 1400 hours, respectively(7).

Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for acetaminophen(SRC), using a log Kow of 0.46(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

Mobility in soil

The Koc of acetaminophen is estimated as 21(SRC), using a log Kow of 0.46(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that acetaminophen is expected to have very high mobility in soil. The pKa of acetaminophen is 9.38(4), indicating that this compound will exist partially in the anion form in the environment and anions generally adsorb less strongly to soils containing organic carbon and clay than their neutral counterparts(5). However, low mobility was observed in soils with a high organic content. Kd values of 46 and 36 in clayey silt and silty sand, respectively, have been reported when the test compound was applied in standard dilution(6). Kd values of 45 and 41 in clayey silt and silty sand, respectively, have been reported when acetaminophen was applied as a test sludge; the average Kd value of 42 indicated low mobility(6). Acetaminophen, present at <0.009 ug/L, was not detected in leachate water (treated effluent from a municipal wastewater treatment facility) following a 23-day soil column leaching experiment using Mohall-Laveen sandy loam (detection limit = 0.009 ug/L)(7).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Environmental hazards

ADR/RID: Yes

IMDG: Yes

IATA: Yes

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

PICCS

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

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