



SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 03/11/2015

Version 1.2

SECTION 1. Identification

Product identifier

Product number	801804
Product name	Benzoyl chloride for synthesis
CAS-No.	98-88-4

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

Identified uses	Chemical for synthesis
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification

GHS Classification

Flammable liquid, Category 4, H227
Acute toxicity, Category 4, Oral, H302
Acute toxicity, Category 4, Inhalation, H332
Acute toxicity, Category 4, Dermal, H312
Skin corrosion, Category 1B, H314
Serious eye damage, Category 1, H318
Skin sensitization, Category 1, H317

For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms



Signal Word
Danger

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Hazard Statements

H227 Combustible liquid.

H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

Precautionary Statements

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

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

P264 Wash skin thoroughly after handling.

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

P271 Use only outdoors or in a well-ventilated area.

P272 Contaminated work clothing must not be allowed out of the workplace.

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

P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

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

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

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

P310 Immediately call a POISON CENTER or doctor/ physician.

P322 Specific measures (see supplemental first aid instructions on this label).

P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.

P363 Wash contaminated clothing before reuse.

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

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

P405 Store locked up.

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula	$\text{C}_6\text{H}_5\text{COCl}$	$\text{C}_7\text{H}_5\text{ClO}$ (Hill)
Molar mass	140.57 g/mol	

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

benzoyl chloride ($\geq 90\%$ - $\leq 100\%$)

98-88-4

Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

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General advice

First aider needs to protect himself.

Inhalation

After inhalation: fresh air. Immediately call in physician.

Skin contact

After skin contact: wash off with plenty of water. Immediately remove contaminated clothing. If available swab with polyethylene glycol 400. Call a physician immediately.

Eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.

Ingestion

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation!). Call a physician immediately. Do not attempt to neutralize.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Irritation and corrosion, Allergic reactions, Cough, Shortness of breath
Risk of blindness!

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Carbon dioxide (CO₂), Dry powder

Unsuitable extinguishing media

Water, Foam

Special hazards arising from the substance or mixture

Combustible.

Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapors possible in the event of fire.

May not get in touch with:

Water

Fire may cause evolution of:

Hydrogen chloride gas, Phosgene

Advice for firefighters

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system. Remove container from danger zone and cool with water.

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SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions

Do not empty into drains.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Work under hood. Do not inhale substance/mixture. Keep workplace dry. Do not allow product to come into contact with water. Avoid generation of vapors/aerosols.

Observe label precautions.

Conditions for safe storage, including any incompatibilities

Tightly closed. Dry.

Store at +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
<i>benzoyl chloride 98-88-4</i>			
ACGIH	Ceiling Limit Value:	0.5 ppm	

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

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Eye/face protection

Tightly fitting safety goggles

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:

protective clothing

Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	stinging
Odor Threshold	No information available.
pH	2 at 1 g/l 68 °F (20 °C)
Melting point	-0.6 °C
Boiling point/boiling range	387.0 °F (197.2 °C) at 1,013 hPa
Flash point	199 °F (93 °C) Method: DIN 51755 Part 1
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	2.5 %(V)
Upper explosion limit	27 %(V)
Vapor pressure	133.3 hPa at 262 °F (128 °C) 0.5 hPa at 68 °F (20 °C)

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Product name

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Relative vapor density	4.88
Density	1.21 g/cm ³ at 68 °F (20 °C)
Relative density	No information available.
Water solubility	at 68 °F (20 °C) (decomposition)
Partition coefficient: n-octanol/water	log Pow: 2.2 (calculated) (Lit.) Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.
Explosive properties	Not classified as explosive.
Oxidizing properties	No information available.
Ignition temperature	1112 °F (600 °C)

SECTION 10. Stability and reactivity

Reactivity

Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

Chemical stability

sensitive to moisture
Upon decomposition in closed containers and tubes risk of bursting due to buildup of overpressure.

Possibility of hazardous reactions

Violent reactions possible with:

Water, Alkali metals, Alkaline earth metals, alkalines, Amines, sulfoxides, Alcohols, Strong oxidizing agents

Risk of ignition or formation of inflammable gases or vapors with:

Metals

Risk of explosion with:

dimethyl sulfoxide, aluminum chloride, sodium azide

Conditions to avoid

Strong heating.
Exposure to moisture.

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Incompatible materials

various metals

Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact

Acute oral toxicity

absorption

Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

Acute inhalation toxicity

LC50 Rat: 1.45 mg/l; 4 h (IUCLID)

absorption

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract, Inhalation may lead to the formation of oedemas in the respiratory tract., The substance has delayed effects.

Corrosive to respiratory system.

Acute dermal toxicity

absorption

Skin irritation

Rabbit

Result: Causes burns.
(IUCLID)

Causes burns.

Eye irritation

Rabbit

Result: Causes burns.
(IUCLID)

Lacrimal irritation due to vapors.

Causes serious eye damage.

Risk of blindness!

Sensitization

May cause an allergic skin reaction.

Carcinogenicity

Did not show carcinogenic effects in animal experiments. (IUCLID)

Specific target organ systemic toxicity - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ systemic toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

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Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC	Group 2A: Probably carcinogenic to humans benzoyl chloride 98-88-4
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Further information

Decomposition of the substance with tissue moisture.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 Pimephales promelas (fathead minnow): 34.1 mg/l; 96 h (IUCLID)

Toxicity to bacteria

EC50 activated sludge: > 100 mg/l; 180 min
OECD Test Guideline 209

Persistence and degradability

Biodegradability

95 %; 20 d
OECD Test Guideline 301D
Readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 2.2
(calculated)
(Lit.) Bioaccumulation is not expected.

Mobility in soil

No information available.

Additional ecological information

Product reacts with water.
The following may develop after reaction of the product with water:
hydrochloric acid
Harmful effect due to pH shift.
Further information on ecology

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Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number UN 1736
Proper shipping name BENZOYL CHLORIDE
Class 8
Packing group II
Environmentally hazardous --

Air transport (IATA)

UN number UN 1736
Proper shipping name BENZOYL CHLORIDE
Class 8
Packing group II
Environmentally hazardous --
Special precautions for user no

Sea transport (IMDG)

UN number UN 1736
Proper shipping name BENZOYL CHLORIDE
Class 8
Packing group II
Environmentally hazardous --
Special precautions for user yes
EmS F-A S-B

SECTION 15. Regulatory information

United States of America

SARA 313

The following components are subject to reporting levels established by SARA Title III, Section 313:

Ingredients

benzoyl chloride	98-88-4	100 %
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SARA 302

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No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Ingredients

benzoyl chloride

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Ingredients

benzoyl chloride

DEA List I

Not listed

DEA List II

Not listed

US State Regulations

Massachusetts Right To Know

Ingredients

benzoyl chloride

Pennsylvania Right To Know

Ingredients

benzoyl chloride

New Jersey Right To Know

Ingredients

benzoyl chloride

California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

TSCA:	All components of the product are listed in the TSCA-inventory.
DSL:	All components of this product are on the Canadian DSL.
KOREA:	Not in compliance with the inventory

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

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Hazard pictograms



Signal Word

Danger

Hazard Statements

H227 Combustible liquid.

H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

Precautionary Statements

Prevention

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

Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

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

P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

Full text of H-Statements referred to under sections 2 and 3.

H227	Combustible liquid.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H332	Harmful if inhaled.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 03/11/2015

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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