
 Information and recommendations for patients

- Patients exposed only to chloroformates gas do not pose a significant risk of secondary contamination. Patients whose clothing or skin is contaminated with liquid or solvents containing chloroformates can secondarily contaminate rescue and medical personnel by direct contact or through off-gassing chloroformates.
 - Chloroformates irritate lungs severely. Because of its slow hydrolysis in the alveoli, serious lung effects and, therefore, symptoms of toxicity may be delayed up to 24 hours. Signs of accumulation of fluid in the lungs (shortness of breath, cyanosis, expectoration, cough) do not usually appear for hours after even severely toxic exposures.
 - There is no antidote to be administered to counteract the effects of chloroformates. Treatment consists of supportive measures.
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Substance information

Methyl chloroformate (CH₃-OCOCI), CAS 79-22-1
Synonyms chloroformic acid methyl ester, methoxycarbonyl chloride

Ethyl chloroformate (C₂H₅-OCOCI), CAS 541-41-3
Synonyms, chloroformic acid ethyl ester, ethoxycarbonyl chloride

2-Ethylhexyl chloroformate (C₈H₁₇-OCOCI), CAS 24468-13-1
Synonyms: chloroformic acid 2-ethylhexyl ester, 2-ethoxyhexylcarbonyl chloride

Isopropyl chloroformate (C₃H₇-OCOCI), CAS 108-23-6
Synonyms : chloroformic acid isopropyl ester, isopropoxycarbonyl chloride

Butyl chloroformate (C₄H₉-OCOCI), CAS 592-34-7
Synonyms: chloroformic acid butyl ester, butoxycarbonyl chloride
They are colorless-yellow clear liquids at room temperature with a melting point of -80 to -55°C and a boiling point of 34 to 138°C.

Methyl chloroformate is the methyl ester of chloroformic acid, a phosgene derivative. Methyl chloroformate should not be confused with methyl chloroform (1,1,1-trichloroethane).

Often chloroformates are used as a solution in organic solvents. Their odor is pungent and can be sharp and suffocating. Chloroformates are hydrolyzed slowly by moisture to form hydrochloric acid. Chloroformates are used as an intermediate in the manufacture of many chemicals including isocyanates, polyurethane, polycarbonates, dyes, crop protection products, and pharmaceuticals.

What immediate health effects can result from exposure to Chloroformate?

Most exposures occur from breathing the gas or by skin/eye contact of the liquid. Exposure to small amounts usually causes eye, nose, and throat irritation. However, the irritating effects can be so mild at first that the person does not leave the area of exposure. Extended exposure can cause severe breathing difficulty, which may lead to chemical pneumonia and death. Severe breathing problems may not develop for as long as 24 hours after exposure.

Are any future health effects likely to occur?

A single small exposure from which a person recovers quickly is not likely to cause delayed or long-term effects. Some persons who have had serious exposures have developed permanent breathing difficulty and tend to develop lung infections easily.

Follow-up instructions

Keep this page and take it with you to your next appointment. Follow only the instructions checked below.

- () Call your doctor or the Emergency Department if you develop any unusual signs or symptoms within the next 24 hours, especially:
 - coughing or wheezing
 - difficulty breathing or shortness of breath
 - increased pain or a discharge from exposed skin or eyes
 - chest pain or tightness
- () No follow-up appointment is necessary unless you develop any of the symptoms listed above.
- () Call for an appointment with Dr. _____ in the practice of _____
When you call for your appointment, please say that you were treated in the Emergency Department at _____ Hospital by _____ and were advised to be seen again in ___ days.
- () Return to the Emergency Department/_____ Clinic on (date) _____
at _____ am/pm for a follow-up examination.
- () Do not perform vigorous physical activities for 1 to 2 days.
- () You may resume everyday activities including driving and operating machinery.
- () Do not return to work for ___ days.
- () You may return to work on a limited basis. See instructions below.
- () Avoid exposure to cigarette smoke for 72 hours; smoke may worsen the condition of your lungs.
- () Avoid drinking alcoholic beverages; alcohol may worsen your clinical conditions.
- () Avoid taking the following medications: _____

- () You may continue taking the following medication(s) that your doctor(s) prescribed for you: _____

- () Other instructions: _____

Signature of patient _____ Date _____
Signature of physician _____ Date _____

References

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