

🏠 Phosgene oxime (/wiki-Phosgene_oxime)

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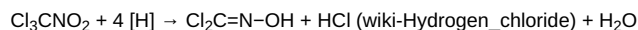
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Phosgene oxime, or **CX**, is an organic compound (wiki-Organic_compound) with the formula (wiki-Chemical_formula)

Cl (wiki-Chlorine)₂C (wiki-Carbon)=N (wiki-Nitrogen)–O (wiki-Oxygen)H (wiki-Hydrogen). It is a potent chemical weapon (wiki-Chemical_weapon), specifically a nettle agent (wiki-Nettle_agent). The compound itself is a colorless solid, but impure samples are often yellowish liquids. It has a strong, disagreeable and irritating odor. It is used as a reagent in organic chemistry (wiki-Organic_chemistry).

Preparation and reactions

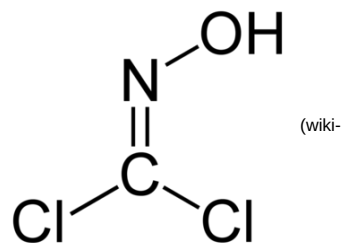
Phosgene oxime can be prepared by reduction (wiki-Reduction_(chemistry)) of chloropicrin (wiki-Chloropicrin) using a combination of tin (wiki-Tin) metal and hydrochloric acid (wiki-Hydrochloric_acid) as the source of the active hydrogen (wiki-Active_hydrogen) reducing agent (wiki-Reducing_agent):



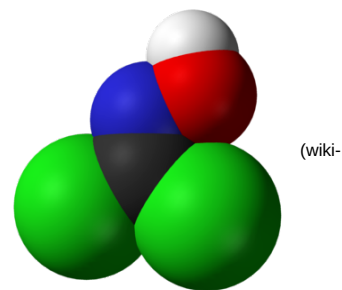
The observation of a transient violet color in the reaction suggests intermediate formation of trichloronitrosomethane (wiki-Trichloronitrosomethane) (Cl₃CNO). Early preparations, using stannous chloride as the reductant, also started with chloropicrin.

The compound is electrophilic (wiki-Electrophilic) and thus sensitive to nucleophiles (wiki-Nucleophiles), including bases (wiki-Base_(chemistry)), which destroy it:

Phosgene oxime



File:Phosgene-oxime-2D.png



File:Phosgene-oxime-HF-3D-vdW.png

Carbon (wiki-Carbon), C
Hydrogen (wiki-Hydrogen), H
Oxygen (wiki-Oxygen), O
Nitrogen (wiki-Nitrogen), N
Chlorine (wiki-Chlorine), Cl

Names

Preferred IUPAC name (wiki-Preferred_IUPAC_name)
1,1-Dichloro-*N*-hydroxymethanimine

Other names
CX
Dichloroformaldehyde oxime
Dichloroformaldoxime
Dichloroformoxime
Hydroxycarbonimidic dichloride

Identifiers

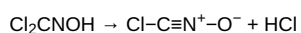
CAS Number (wiki-CAS_Registry_Number)	1794-86-1 (https://commonchemistry.cas.org/detail?cas_m=1794-86-1) ✓
3D model (JSmol (wiki-JSmol))	Interactive image (https://chemapps.stolaf.edu/jmol/jmol.php?model=Cl%2FC%28Cl%29%3DN%5CO)
ChemSpider (wiki-ChemSpider)	59024 (https://www.chemspider.com/Chemical-Structure.59024.html) ✓
PubChem (wiki-PubChem) CID (Compound ID)	65582 (https://pubchem.ncbi.nlm.nih.gov/compound/65582)
UNII (wiki-Unique_Ingredient_Identifier)	G45S3149SQ (https://precision.fda.gov/uniisearch/srs/unii/G45S3149SQ) ✓

CompTox Dashboard (wiki-CompTox_Chemicals_Dashboard) (EPA (U.S. Environmental Protection Agency))	DTXSID9075292 (https://comptox.epa.gov/dashboard/chemical/details/DTXSID9075292) (https://www.wikidata.org/wiki/Q3241634#P3117)
InChI (wiki-International_Chemical_Identifier)	InChI=1S/CHCl2NO/c2-1(3)4-5/h5H ✓ Key: JIRJHEXNDQBKRZ-UHFFFAOYSA-N ✓
InChI=1/CHCl2NO/c2-1(3)4-5/h5H	Key: JIRJHEXNDQBKRZ-UHFFFAOYAP
SMILES (wiki-Simplified_molecular-input_line-entry_system)	Cl/C(Cl)=N\O
Properties	
Chemical formula (wiki-Chemical_formula)	Cl ₂ CNOH
Molar mass (wiki-Molar_mass)	113.93 g·mol ⁻¹
Appearance	colorless or white solid
Odor (wiki-Odor)	Strong, disagreeable and irritating
Melting point (wiki-Melting_point)	35 to 40 °C (95 to 104 °F; 308 to 313 K)
Boiling point (wiki-Boiling_point)	128 °C (262 °F; 401 K)
Solubility in water (wiki-Aqueous_solution)	70%
Hazards	
Occupational safety and health (wiki-Occupational_safety_and_health) (OHS/OSH):	
Main hazards	Highly toxic
Related compounds	
Related compounds	Formaldoxime (wiki-Formaldoxime) Phosgene (wiki-Phosgene) Oxime (wiki-Oxime)
Except where otherwise noted, data are given for materials in their standard state (wiki-Standard_state) (at 25 °C [77 °F], 100 kPa).	
✗ verify (https://en.wikipedia.org/w/index.php?title=Special:ComparePages&rev1=464204793&page2=Phosgene+oxime) (what is ✗?)	
Infobox references	



Phosgene oxime has been used to prepare heterocycles (wiki-Heterocyclic_compound) that contain N-O bonds, such as isoxazoles (wiki-Isloxazole).

Dehydrohalogenation (wiki-Dehydrohalogenation) upon contact with mercuric oxide (wiki-Mercuric_oxide) generates chlorine fulminate, a reactive nitrile oxide (wiki-Nitrile_oxide):



Toxicity

Phosgene oxime is classified as a vesicant (wiki-Blister_agent) even though it does not produce blisters. It is toxic (wiki-Toxic) by inhalation, ingestion, or skin contact. The effects of the poisoning occur almost immediately. No antidote for phosgene oxime poisoning is known. Generally, any treatment is supportive. Typical physical symptoms of CX exposure are as follows:

- **Skin:** Blanching surrounded by an erythematous (wiki-Erythema) ring can be observed within 30 seconds of exposure. A wheal (wiki-Wheal_response) develops on exposed skin within 30 minutes. The original blanched area acquires a brown pigmentation by 24 hours. An eschar (wiki-Eschar) forms in the pigmented area by 1 week and sloughs after approximately 3 weeks. Initially, the effects of CX can easily be misidentified as mustard gas (wiki-Mustard_gas) exposure. However, the onset of skin irritation resulting from CX exposure is a great deal faster than mustard gas, which typically takes several hours or more to cause skin irritation.
- **Eyes:** Eye examination typically demonstrates conjunctivitis (wiki-Conjunctivitis), lacrimation (wiki-Lacrimation), lid edema, and blepharospasm (wiki-Blepharospasm) after even minute exposures. More severe exposures can result in keratitis (wiki-Keratitis), iritis (wiki-Iritis), corneal (wiki-

Corneal) perforation, and blindness (wiki-Blindness).

- Respiratory: Irritation of the mucous membranes (wiki-Mucous_membranes) may be observed on examination of the oropharynx and nose. Evidence of pulmonary edema, including rales and wheezes, may be noted on auscultation (wiki-Auscultation). Pulmonary thromboses (wiki-Pulmonary_embolism) are prominent features of severe CX exposure.
- Gastrointestinal: Some animal data suggest that CX may cause hemorrhagic inflammatory changes in the GI tract.

Agents used in
chemical warfare (wiki-Chemical_warfare) incapacitation (wiki-Incapacitating_agent) riot control (wiki-Riot_control)

Categories: Chemical weapons (wiki/Category-Chemical_weapons) | Organochlorides (wiki/Category-Organochlorides)
| Oximes (wiki/Category-Oximes)

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