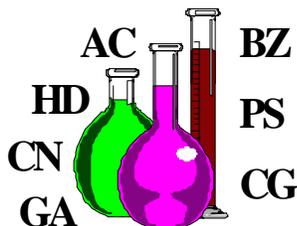


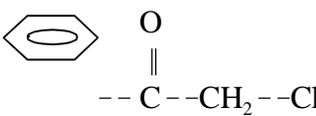
U.S. Army Center for Health Promotion and Preventive Medicine



*Detailed Facts About Tear Agent 2-Chloroacetophenone
(CN)*

218-19-1096

Physical Properties of Tear Agent 2-Chloroacetophenone

<i>Chemical Structure</i>	
<i>Chemical Formula</i>	C ₆ H ₅ COCH ₂ Cl
<i>Description</i>	CN is a colorless-to gray crystalline solid with a sharp, irritating floral odor. The odor threshold for CN is 0.1 mg/m ³ .
<i>Molecular Weight</i>	154.60
<i>Boiling Point</i>	247°C
<i>Vapor Pressure (mm Hg)</i>	0.0026 @ 0°C 0.0041 @ 20°C 0.152 @ 51.7°C
<i>Freezing Point</i>	54°C
<i>Density</i>	Solid = 1.318 @ 20°C Liquid = 1.187 @ 58°C Vapor = 5.3 (air = 1)
<i>Solubility</i>	Insoluble in water
<i>Flash Point</i>	118°C

Volatility
2.36 mg/m³ @ 0°C
34.3 mg/m³ @ 20°C
1060 mg/m³ @ 51.7°C

Toxicity Values
IC_{t50} = 80 mg-min/m³
LC_{t50} = 7,000 mg-min/m³ from solvent
= 14,000 mg-min/m³ from grenade
RfC (inhalation) = 0.00003 mg/m³

Exposure Limits

Workplace Time-Weighted Average - 0.3 mg/m³
General Population Limits - 0.00003 mg/m³

Toxic Properties of Chloroacetophenone

The United States considers agent CN (popularly known as mace or tear gas) and its mixtures with various chemicals to be obsolete for military deployment. It is highly toxic by inhalation and ingestion.

Overexposure Effects

Alpha-chloroacetophenone vapors may cause a tingling or runny nose, burning and/or pain of the eyes, blurred vision, and tears. Burning in the chest, difficult breathing, and nausea may also occur as well as skin irritation, rash, or burns. It can also cause difficulty if swallowed.

Emergency and First Aid Procedures

Inhalation: remove the victim to fresh air immediately; perform artificial respiration if breathing has stopped; keep victim warm and at rest; seek medical attention immediately.

Eye Contact: wash eyes immediately with copious amounts of water, lifting the lower and upper lids occasionally; do not wear contact lenses when working with this chemical; seek medical attention immediately.

Skin Contact: wash the contaminated skin using soap or mild detergent and water immediately; remove the contaminated clothing immediately and wash the skin using soap or mild detergent and water; seek medical attention immediately when there are chemical burns or evidence of skin irritation.

Ingestion: induce vomiting by having victim touch the back of the throat with finger or by giving victim syrup of ipecac as directed; do not induce vomiting if victim is unconscious; seek medical attention immediately.

Protective Equipment

Protective Gloves:	Wear impervious gloves.
Eye Protection:	Wear dust- and splash-proof safety goggles where there is any possibility of solid CN or liquids containing CN may contact the eyes; wear face shield; wear appropriate protective mask.
Other:	Wear a complete set of protective clothing to include gloves and lab coat, apron, boots, plastic coveralls; other protective clothing and equipment should be available to prevent contact with skin or clothing; remove contaminated clothing immediately; do not wear clothing until it has been properly laundered.

Reactivity Data

Stability:	Stable in closed containers at room temperature under normal storage and handling conditions.
Incompatibility:	Water or steam.
Hazardous Decomposition:	Toxic and corrosive vapors are produced when combined with water or steam.

Persistency Short because the compounds are disseminated as an aerosol.

References

1. Code of Federal Regulations, Part 1910.1000, Title 29, (29 CFR 1910.1000), *Air Contaminants*, 1994.
2. Department of the Army Field Manual (DA FM) 3-9, *Potential Military Chemical/Biological Agents and Hazardous Chemicals*, 1990.
3. Department of the Army Technical Manual (DA TM) 3-250, *Storage, Shipment, Handling, and Disposal of Chemical Agents and Hazardous Chemicals*, 1969.
4. *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices for 1995-1996*, American Conference of Governmental Industrial Hygienists (ACGIH), Cincinnati, Ohio.

5. Genium's Reference Collection, *Material Safety Data Sheet No. 603, 2-Chloroacetophenone*, Genium Publishing Corporation, Schenectady, New York, 1986.
6. U.S. Army Chemical Command Materiel Destruction Agency, *Site Monitoring Concept Study*, 15 September 1993.

For more information, contact:
Kenneth E. Williams
USACHPPM
Aberdeen Proving Ground, MD 21010-5422
Commercial (410) 671-2208, DSN: 584-2208
email: kwilliam@aeha1.apgea.army.mil