# Chloroacetyl chloride

| CAS number: | 79-04-9 |
| --- | --- |
| Synonyms: | Chloroacetic acid chloride, chloroacetic chloride, monochloroacetyl chloride |
| Chemical formula: | C2H2Cl2O |
| Structural formula: | — |

Workplace exposure standard (retained)

| TWA: | **0.05 ppm (0.23 mg/m3)** |
| --- | --- |
| STEL: | **0.15 ppm (0.69 mg/m3)** |
| Peak limitation: | **—** |
| Notations: | **Sk.** |
| IDLH: | **1.3 ppm (66 mg/m3)** |
| Sampling and analysis: | The recommended value is quantifiable through available sampling and analysis techniques. |

## Recommendation and basis for workplace exposure standard

A TWA of 0.05 ppm (0.23 mg/m3) is recommended to protect for eye and respiratory tract irritation in exposed workers.

A STEL 0.15 ppm (0.69 mg/m3) is recommended to protect for corrosive effects of the eyes and skin

## Discussion and conclusions

Chloroacetyl chloride (CAC) is primarily used as an intermediate in the manufacture of chloroacetophenone and other chemicals.

It is extremely irritating to the eyes and respiratory tract and at higher concentrations can cause corrosion of the skin and eyes. One report notes no eye irritation in an individual at a concentration of 0.14 ppm, but painful irritation and lacrimation at 1 ppm. A sub-chronic inhalation study of rats, mice and hamsters showed respiratory and eye irritation in all animals at 0.5 ppm, the lowest concentration tested, with respiratory tract lesions reported at 2.5 ppm (ACGIH, 2018).

Noting irritation and corrosive effects reported in animals, the current TWA of 0.05 ppm and STEL of 0.15 ppm are considered to provide an adequate safety margin to protect exposed workers.

## Recommendation for notations

Not classified as a carcinogen according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Not classified as a skin sensitiser or respiratory sensitiser according to the GHS.

A skin notation is recommended based on systemic effects following skin contact exposure in humans.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA 1991 TWA: 0.05 ppm (0.23 mg/m3); STEL: 0.15 ppm (0.69 mg/m3) | |
|  |
| ACGIH 2001 TLV-TWA: 0.05 ppm (0.23 mg/m3) TLV-STEL: 0.15 ppm (0.69 mg/m3) |
| TLV-TWA and TLV-STEL recommended to minimise the potential for eye irritation, lacrimation, skin erythema and burns, respiratory effects including dyspnoea, cyanosis, cough, and GIT effects.  Summary of data:  Human data:   * Extremely irritating to the eyes and respiratory tract including lacrimation * Acute exposure reported to produce skin erythema and burns, eye irritation, lacrimation, and burns, respiratory effects including dyspnoea, cyanosis, cough and GIT effects * Report from an individual industrial hygienist (no further information): * 1 ppm painful eye irritation and lacrimation * 0.140 ppm no eye irritation, strong odour * 0.011 ppm no odour detected * 0.023 ppm odour barely detectable * Report of respiratory difficulties and coma soon after large skin exposure to mixture of CAC, xylidine and benzene; another report of 2 fatalities following exposure to CAC, 1 involving massive skin contact.   Animal data:   * Sub-chronic inhalation study in rats, mice and hamsters; 6 h/d, 5 d/wk for 4 wk; * slight irritation effects at 0.5 ppm including slight to moderate inflammation, hypertrophy, hyperplasia and occasionally, squamous metaplasia in the respiratory epithelium of the nasal mucosa * severity and incidence of irritation are concentration dependant * grossly visible respiratory tract lesions in rats and mice at 2.5 or 5 ppm; most severe in nasal region * no gross pathologic respiratory effects in hamsters * Corrosive to the skin and eyes * Acute minimum lethal dose by skin in rabbits reported as between 316–501 mg/kg * corrosion of dermal barrier likely to facilitate systemic absorption * LC50 in rats (1 h) 660 ppm for males, >747 ppm for females * Based on findings from other analytical studies, actual concentrations in acute studies may be lower than reported concentrations, possibly due to degradation to chloroacetic acid and hydrochloric acid in presence of moisture.   Negative mutagenicity results in five strains of *Salmonella*, with or without metabolic activation. |
| DFG 1983 Not assigned |
| A MAK cannot be derived based on the available evidence.  No further information. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN NA NA |
| No report. |

### Secondary source reports relied upon

NIL.

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | No |
| --- | --- |
| **The chemical is not a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations |
| --- | --- |
| SWA | NA |
| HCIS | NA |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | Skin |
| DFG | — |
| SCOEL | NA |
| HCOTN | NA |
| IARC | NA |
| US NIOSH | NA |

NA = not applicable (a recommendation has not been made by this Agency); — = the Agency has assessed available data for this chemical but has not recommended any notations

### Skin notation assessment

| Calculation |
| --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Adverse effects in human case study: | yes | 4.00 |  |  | | Dermal LD50 ≤1000 mg/kg: |  |  |  |  | | Dermal repeat-dose NOAEL ≤200 mg/kg: |  |  |  |  | | Dermal LD50/Inhalation LD50 <10: |  |  |  |  | | *In vivo* dermal absorption rate >10%: |  |  |  |  | | Estimated dermal exposure at WES >10%: |  |  |  |  | |  |  |  | **a skin notation is warranted** | | |

### IDLH

| Is there a suitable IDLH value available? | Yes |
| --- | --- |

## Additional information

| Molecular weight: | 112.95 |
| --- | --- |
| Conversion factors at 25°C and 101.3 kPa: | 1 ppm = Number mg/m3; 1 mg/m3 = Number ppm |
| This chemical is used as a pesticide: |  |
| This chemical is a biological product: |  |
| This chemical is a by-product of a process: |  |
| A biological exposure index has been recommended by these agencies: | ACGIH  DFG  SCOEL |

## Workplace exposure standard history

| Year | Standard |
| --- | --- |
| Click here to enter year |  |

## References

American Conference of Industrial Hygienists (ACGIH®) (2018) TLVs® and BEIs® with 7th Edition Documentation, CD-ROM, Single User Version. Copyright 2018. Reprinted with permission. See the [*TLVs® and BEIs® Guidelines section*](http://www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations) on the ACGIH website.

Deutsche Forschungsgemeinschaft (DFG) (1983) Chloracetylchlorid – MAK value documentation.

US National Institute for Occupational Safety and Health (NIOSH) (2016) Immediately dangerous to life or health concentrations – Chloroacetyl chloride.