# alPha-chloroacetophenone

| CAS number: | 532-27-4 |
| --- | --- |
| Synonyms: | Phenacyl chloride, chloroacetophenone,  α-chloroacetophenone, ω-chloroacetophenone, 1-chloroacetophenone, chloromethyl phenyl ketone,  2-chloro-1-phenylethanone,  phenyl chloromethyl ketone |
| Chemical formula: | C8H7ClO |

Workplace exposure standard (amended)

| TWA: | **0.1 mg/m3 (0.02 ppm)** |
| --- | --- |
| STEL: | **0.3 mg/m3 (0.05 ppm)** |
| Peak limitation: | **—** |
| Notations: | **—** |
| IDLH: | **15 mg/m3** |
| Sampling and analysis: | The recommended value is readily quantifiable through currently available sampling and analysis techniques. |

## Recommendation and basis for workplace exposure standard

The TWA of 0.1 mg/m3 and STEL of 0.3 mg/m3 are recommended to protect for eye and respiratory irritation in exposed workers.

## Discussion and conclusions

Commonly called mace, alpha-Chloroacetophenone is used primarily as a riot-control agent and in personal protective devices. Occupational exposure will occur primarily during manufacture and packaging operations, during loading of solutions for aerosols and when carrying a canister in a holster (ACGIH, 2018; HCOTN, 2004).

In humans, irritation of the eyes and skin occurs rapidly at 10 mg/m3 with effects reversible after approximately 20 minutes following removal from exposure. A minimal irritation concentration of 0.3 mg/m3 (per minute) is reported in humans. A minimal observed adverse effect level of 1 mg/m3 for irritation of the nasal passage was reported in a two year inhalation study in rats (HCOTN, 2004).

The recommended TWA is derived from the reported minimal observed adverse effect level of 1 mg/m3 and the application of a factor of 10 to account for interspecies variation. The recommended STEL is derived from eye lacrimation and respiratory irritation threshold estimate of 0.3 mg/m3 (per minute) in humans.

## 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.

There are insufficient data to recommend a skin notation.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA 1991 TWA: 0.05 ppm (0.32 mg/m3) | |
|  |
| ACGIH 2001 TLV-TWA: 0.05 ppm (0.32 mg/m3) |
| The TLV-TWA recommended to minimise the potential for irritation of the skin, respiratory tract and eyes, with lacrimation.  Summary of data:  Human data:   * Estimated lethal concentration time of exposure (Ct) of 8,500 mg x min/m3 for 10 min * Estimated effective concentration to produce casualties is >100 mg/m3 * Ct of 150–200 mg x min/m3 required to force withdrawal from exposure * Reported a minimum effective Ct of 20–30 mg x min/m3 * No systemic or chronic effects reported.   Animal data:   * 14 d inhalation studies in rats and mice: * death in the 1st week of all rats exposed to 19, 43 or 64 mg/m3 * 1/5 male rats died in 2nd week exposed to 10 mg/m3 * all mice exposed to ≥10 mg/m3 died in 1st week * 13 wk inhalation studies in rats and mice: * ≥0.5 mg/m3 produced eye irritation in rats * no rat deaths * 10% of female mice exposed at 0.5 and 4 mg/m3 died * no chemical-related lesions in either animal * Reported to be a co-carcinogen in mice dosed dermally * Negative carcinogenicity in rats dosed *via* inhalation.   Not mutagenic in *Salmonella typhimurium* |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN 2004 TWA: 0.1 mg/m3; STEL: 0.3 mg/m3) |
| The TWA and STEL are recommended to minimise the potential for irritation effects in exposed workers.  Summary of additional data:  Human data:   * Rapid irritation of eyes and skin at 10 mg/m3 * effects reversible ≈20 min after removal from exposure * Minimal irritant concentration 0.3–1 mg-min/m3 * ICt50: 20–50 mg x min/m3 (concentration x time, incapacitating/irritating to 50% of an exposed population).   Animal data:   * NOAEL of 0.25 mg/m3 for eye irritation, gross or microscopic lesions, decreased bw and increased relative liver weight (rats, mice; 13 wk) * Minimal observed adverse effect level of 1 mg/m3 for irritation of the nasal passage in rats (2 yr inhalation).   Minimal observed adverse effect level of 1 mg/m3 (13 w inhalational study) used as starting point for derivation of TWA; overall assessment factor of 8 for absence of NOAEL, intra- and interspecies variation, and the type of effect.  STEL derived from threshold estimates of 0.3 mg x min/m3 for eye (lachrymation) and respiratory tract irritation in humans. |

### 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 | Carcinogenicity – A4 |
| DFG | NA |
| 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 |
| --- |
| Insufficient data to warrant a skin notation. |

### IDLH

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

## Additional information

| Molecular weight: | 154.59 |
| --- | --- |
| 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.

Health Council of the Netherlands (HCOTN) (2004) 2-Chloroacetophenone. Health-based Reassessment of Administrative Occupational Exposure Limits. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/097.