# Chlorosulphonic acid

| CAS number: | 7790-94-5 |
| --- | --- |
| Synonyms: | Sulfurochloridic acid, CSA, sulfuric chlorohydrin, chlorosulfuric acid, chlorosulfuric acid, monchlorosulfonic acid |
| Chemical formula: | HSO3Cl |
| Structural formula: | — |

Workplace exposure standard (interim)

| TWA: | **0.209 ppm (1 mg/m3)** |
| --- | --- |
| STEL: | — |
| Peak limitation: | — |
| Notations: | — |
| IDLH: | — |
| Sampling and analysis: | The recommended value is quantifiable through available sampling and analysis techniques. |

## Recommendation and basis for workplace exposure standard

An interim TWA of 0.209 ppm (1 mg/m3) is recommended to protect from corrosive and irritant effects to the eyes, skin and respiratory tract in exposed workers.

Given the limited data available from the primary sources, it is recommended that a review of additional sources be conducted at the next scheduled review.

## Discussion and conclusions

Chlorosulphonic acid is used as a chemical intermediate for dyes, pesticides resins, pharmaceuticals, surfactants processes and manufacture of synthetic detergents.

Chlorosulphonic acid is not mutagenic or a reproductive toxicant in animals (ECHA, 2006). Limited toxicological data are currently available from human and animal studies. It is highly acidic (ECHA, 2019) and a severe irritant and corrosive to the eyes and skin (AIHA, 2016). It reacts with water to form hydrochloric (HCl) and sulphuric acid (H2SO4). Data indicate these breakdown products cause the corrosive health effects (OARS, 2016).

Limited toxicological data are available to support a health-based recommendation. The recommended TWA of 0.209 ppm is considered sufficiently low to protect for corrosive effects in exposed workers. An evaluation of additional sources is recommended at the next scheduled review.

## 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 not recommended based on the available evidence.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA 2001 TWA: 0.209 ppm (1 mg/m3) | |
|  |
| ACGIH NA NA |
| No report. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA 2016 Not assigned |
| No WEEL value established.  Refers to HCl and H2SO4 to determine control and management practices due to rapid reaction with water to form HCl and H2SO4.  Toxicity expected to be caused by corrosive breakdown that causes irritation to eyes, skin and respiratory tract.  Highly irritating to skin resulting in burns, swelling, necrosis and erythema in animals.  No data available to determine genotoxicity, carcinogenicity or skin sensitivity.  Summary of data:  Human:   * Overexposure to vapours may corrode teeth.   Animal:   * LC50: 52.5 mg/m3; (rats, 2 h) * LD50: 87.5–175 mg/kg; (guinea pig, dermal) * Severe ocular irritation in mice and rats. |
| HCOTN NA NA |
| No report. |

### Secondary source reports relied upon

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| ECHA |  | 2019 | * Did not induce *E.coli* gene mutation *in vitro* * Not likely to be classified as a gene mutant *in vitro* * Not classified as a reproductive and developmental toxicant based on animal testing * Skin sensitivity testing not conducted due to strong acidic properties (pH < 1) * LC50: 38.5 mg/m3; (rats, 4 h) * Classified “category 1” for acute inhalation toxicity with LC50 value < 0.05 mg/L (0.5 ppm) * Inhalation route DNEL: 0.111 mg/m3 (0.02 ppm). |

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | No |
| --- | --- |
| **The chemical is a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations |
| --- | --- |
| SWA | NA |
| HCIS | NA |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | NA |
| 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 |
| --- |
| |  |  |  |  | | --- | --- | --- | --- | | Adverse effects in human case study: | no |  |  | | Dermal LD50 ≤1000 mg/kg: | yes | 3.00 |  | | Dermal repeat-dose NOAEL ≤200 mg/kg: |  |  |  | | Dermal LD50/Inhalation LD50 <10: | no | -3.00 |  | | *In vivo* dermal absorption rate >10%: |  |  |  | | Estimated dermal exposure at WES >10%: |  |  |  | |  |  | 0 | **a skin notation is not warranted** | |

### IDLH

| Is there a suitable IDLH value available? | No |
| --- | --- |

## Additional information

| Molecular weight: | 116.53 |
| --- | --- |
| 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

European Chemicals Agency Regulation (ECHA) No 1907/2006 of the European Parliament and of the Council of 18 December 2019 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Occupational Alliance for Risk Science (OARS) (2016) Workplace environmental exposure level – Chlorosulfonic Acid.