# SulFur monochloride

| CAS number: | 10025-67-9 |
| --- | --- |
| Synonyms: | Disulfur dichloride, sulfur chloride, sulfur subchloride |
| Chemical formula: | S2Cl2 |

Workplace exposure standard (interim)

| TWA: | **—** |
| --- | --- |
| STEL: | **—** |
| Peak limitation: | **1 ppm (5.5 mg/m3)** |
| Notations: | **—** |
| IDLH: | **5 ppm** |
| **Sampling and analysis:** The recommended value is quantifiable through available sampling and analysis techniques. | |

## Recommendation and basis for workplace exposure standard

A peak limitation of 1 ppm (5.5 mg/m3) is recommended to protect for acute eye, mucous membrane, dermal and upper respiratory tract irritation in exposed workers.

## Discussion and conclusions

Sulfur monochloride is used in vulcanised rubber, chemical synthesis, wood hardening, textile finishing and gold extraction.

The critical effects of exposure are eye, mucous membrane, dermal and upper respiratory tract irritation.

Limited data from human and animal studies are available in the primary and secondary sources. Inhalation at 2 to 9 ppm of sulfur monochloride is considered mildly irritating in workers. However, the sulfur monochloride likely included a high proportion of hydrogen chloride (HCl) which is used as an analogy for the TLV-TWA (ACGIH, 2018). The reported irritation threshold is 12 mg/m3 (ACGIH, 2018). In workers exposed at 2 to 8 ppm in the rooms of a factory, frequent inflammations of the nasal and pharyngeal mucosa are observed (DFG, 2000).

Given the absence of any other exposure data, the peak limitation of 1 ppm by SWA, ACGIH (2018) and HCOTN (2004) is recommended to be retained in the interim to limit irritant effects. A review of additional data sources is recommended at the next scheduled review to address the absence of chronic data.

## 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 Peak limitation: 1 ppm (5.5 mg/m3) | |
|  |
| ACGIH 2001 TLV-Ceiling: 1 ppm (5.5 mg/m3) |
| TLV-Ceiling recommended to minimise the risk of eye, mucous membrane, dermal and upper respiratory tract irritation in exposed workers.  Summary of data:  TLV- Ceiling assigned based on mild irritation at 2–­9 ppm in exposed workers and by analogy to less toxic HCl (TLV- Ceiling: 2 ppm).  Human data:   * Irritation threshold 12 mg/m3 (no further information provided) * Considered an ocular, mucous membrane and dermal irritant with a nauseating odour * Splashes to the eye results in severe damage * Dermal contact results in burns and irritation * Workers exposed at 2–­9 ppm (inhalation) considered mildly irritating, exposure likely included a high proportion of HCl.   Animal data:   * Mice exposed at 150 ppm (inhalation) for 1 min died * Cats survived 15 min inhalation exposure at 12 ppm, 15 min exposure at 48 ppm could induce delayed death after a few days * Considered an upper respiratory tract irritant as a result of its ability to release HCl and sulphur dioxide on contact with moisture   Insufficient data to recommend a skin, sensitiser or carcinogen notation. |
| DFG 2000 Not assigned |
| Due to inadequate data, it is not possible to derive a scientifically based OEL.  Summary of additional data:   * 112 mg/m3 (20 ppm) given as the concentration for severe toxic effects in persons after 1 min exposure (inhalation) * Exposure at 2­–8 ppm in the rooms of a factory, frequent nasal inflammations and pharyngeal mucosa observed in workers * LC50: 450 ppm (rats, 4 h) * LD50: 132 mg/kg (rats, oral) * Exposure at 100 ppm (rabbits, rats, guinea pigs, 25 d) resulted in 1 rabbit fatality: * liver and kidneys damaged in rabbits and rats * guinea pig showed no pathological changes * 1 rabbit, 1 guinea pig, 1 rat and 2 mice were exposed at 1,800 ppm (inhalation) for 1 h resulted in irritation to the mucous membranes and purulent inflammation of the eyes * Negative results in mutagenicity assay. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN 2004 Ceiling limit: 1 ppm (6 mg/m3) |
| The committee considers the toxicological database too poor to justify recommendation of a health-based occupational exposure limit (HBROEL). |

### Secondary source reports relied upon

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| ECHA |  | 2011 | No additional information |

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | Insufficient data |
| --- | --- |
| Is the chemical carcinogenic with a mutagenic mechanism of action? | Insufficient data |
| **Insufficient data are available to determine if the chemical is a non-threshold based genotoxic carcinogen.** | |

## Notations

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

Insufficient data to assign a skin notation.

### IDLH

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

## Additional information

| Molecular weight: | 102.97 |
| --- | --- |
| Conversion factors at 25°C and 101.3 kPa: | 1 ppm = 5.52 mg/m3; 1 mg/m3 = 0.181 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) (2000) Dischwefeldichloride – MAK value documentation.

Health Council of the Netherlands (HCOTN) (2004) Disulphur dichloride. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/119.

US National Institute for Occupational Safety and Health (NIOSH) (1994) Immediately dangerous to life or health concentrations – Sulfur monochloride.