CARBON TETRABROMIDE

CAS number: 558-13-4

Synonyms: Tetrabromomethane, methane tetrabromide, carbon bromide

Chemical formula: CBr_4

Structural formula:

Workplace exposure standard (retained)

TWA: **0.1 ppm (1.4 mg/m^3)**

STEL: **0.3 ppm (4.1 mg/m^3)**

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

The TWA of 0.1 ppm and STEL of 0.3 ppm are recommended to protect for irritation of the eyes, skin and upper respiratory tract in exposed workers.

Discussion and conclusions

Carbon tetrabromide is used as a chemical intermediate in organic synthesis.

Toxicological data are limited and no quantitative data for human exposures are available. Effects reported after acute exposures include upper respiratory irritation and injury to the lungs, liver and kidneys in humans. In a six-month study with rats, guinea pigs and rabbits, no effects are reported following intermittent exposure of 0.3 to 0.5 ppm (ACGIH, 2018; HCOTN, 2004). In a four-month rat study, exposures of 0.07 to 74 ppm for four hours per day resulted in irritation of eyes and respiratory tract (ACGIH, 2018).

Based on the limited information in animals, the current TWA of 0.1 ppm and STEL of 0.3 ppm are retained to prevent irritation in 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.

There are insufficient data to recommend a skin notation.

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	***1991***	***TWA: 0.1 ppm (1.4 mg/m^3); STEL: 0.3 ppm (4.1 mg/m^3)***
ACGIH	***2001***	***TLV-TWA: 0.1 ppm (1.4 mg/m^3); TLV-STEL: 0.3 ppm (4.1 mg/m^3)***

TLV-TWA and TLV-STEL recommended to minimise the potential for lacrimation and ocular, dermal and upper respiratory tract irritation.

Summary of data:

Human data:

- No quantitative exposure data supplied
- Causes lacrimation at low concentrations
- Acute exposures at high concentrations reported to result in upper respiratory irritation and injury to the lungs, liver and kidneys
- Effects from chronic exposure to low concentrations primarily result in liver damage.

Animal data:

- Caused severe eye irritation, permanent corneal damage and slight skin irritation in studies with rabbits
  - reported corneal damage reversible if material is washed promptly from the eye
- Inhalation study in rats exposed for 7 h/d, 5 d/wk for 6 mo reported no effect at concentrations estimated to be 0.3–0.5 ppm by volume
- Rats exposed to 0.07–74 ppm for 4 h/d for 4 mo reported irritation of the eyes and respiratory tract.

Insufficient data to recommend skin, sensitisation or carcinogenicity notations.

DFG	***NA***	***NA***
No report.		
SCOEL	***NA***	***NA***
No report.		
OARS/AIHA	***NA***	***NA***
No report.		
HCOTN	***2004***	***TWA: 0.1 ppm (1.4 mg/m^3)***

Toxicological database is considered insufficient to recommend a health based value.

Summary of additional data:

- Mild to advanced degenerative changes, cloudy swelling, necrosis, and fatty changes have been observed in the livers of rats after exposure to 4–8 ppm for 1 or 2 wk (no further information)
- 6 mo study with rats, guinea pigs, and rabbits, intermittent exposure to 4–7 mg/m^3 (0.3–0.5 ppm) did not induce any effect; considered to be a NOAEL.

Secondary source reports relied upon

NIL.

Carcinogenicity — non-threshold based genotoxic carcinogens

Is the chemical mutagenic?	No
Is the chemical carcinogenic with a mutagenic mechanism of action?	No

The chemical is not a non-threshold based genotoxic carcinogen.

Notations

Source	Notations
SWA	—
HCIS	—
NICNAS	NA
EU Annex	NA
ECHA	—
ACGIH	—
DFG	NA
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

Calculation
Insufficient data to assign a skin notation.

IDLH

Is there a suitable IDLH value available?	No

Additional information

Molecular weight:	331.63
Conversion factors at 25°C and 101.3 kPa:	1 ppm = Number mg/m^3; 1 mg/m^3 = 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* on the ACGIH website.

Health Council of the Netherlands (HCOTN) (2004) Carbon tetrabromide. Health-based reassessment of administrative occupational exposure limits. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/114.