# Boron tribromide

| CAS number: | 10294-33-4 |
| --- | --- |
| Synonyms: | Boron bromide, tribromoborane, tribromoboron |
| Chemical formula: | BBr3 |

Workplace exposure standard (amended)

| TWA: | — |
| --- | --- |
| STEL: | — |
| Peak limitation: | **0.7 ppm (7.19 mg/m3)** |
| Notations: | — |
| IDLH: | — |
| Sampling and analysis: | There is uncertainty regarding quantification of the recommended value with available sampling and/or analysis techniques |

## Recommendation and basis for workplace exposure standard

A peak limitation of 0.7 ppm (7.19 mg/m3) is recommended to protect for corrosion and irritation of the respiratory tract in exposed workers.

## Discussion and conclusions

Boron tribromide is used in the electronics industry for plasma etching in semiconductor device manufacturing and as a catalyst in the manufacture of high purity boron.

Limited human and animal data are available. It hydrolyses rapidly to hydrogen bromide upon contact with water. This breakdown causes burns to the respiratory tract, eyes and skin. The recommended peak limitation of 0.7 ppm (7.19 mg/m3) has been calculated based on assumptions that one mole of boron tribromide breaks down to three moles of hydrogen bromide at the tissue level (lung mucosa). According to ACGIH, this is one-third TLV-Ceiling of 2 ppm for hydrogen bromide (HBr) (ACGIH, 2018).

## Recommendation for notations

The current volume of data is considered insufficient to support recommendation of any notations.

Not classified as carcinogenic 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 (10 mg/m3) | |
|  |
| ACGIH 2016 TLV-C: 0.7 ppm (7.19 mg/m3) |
| TLV-Ceiling recommended to protect for upper and lower respiratory tract irritation.  Rapid hydrolysis anticipated to cause significant burns to respiratory tract, eyes or skin. Burns expected to be similar to hydrogen fluoride and hydrogen chloride effects observed when relative boron compounds (BF3 & BCl3) contact water.  Value calculated by ACGIH based on 1/3 the TLV-Ceiling (2 ppm) for hydrogen bromide.  Insufficient data available for Skin, RSEN, DSEN or carcinogenicity notation recommendations.  No human studies identified.  No animal toxicological data identified. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN NA NA |
| No report. |

### Secondary source reports relied upon

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| ECHA |  | 2019 | * Fatal if inhaled and causes severe skin burns and eye damage. |

### 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 | 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 |
| --- |
| Insufficient data to assign a skin notation. |

### IDLH

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

## Additional information

| Molecular weight: | 250.57 |
| --- | --- |
| 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.

European Chemicals Agency (ECHA) (2019 update) Boron tribromide – REACH assessment.