# hydrogen bromide

| CAS number: | 10035-10-6 |
| --- | --- |
| Synonyms: | Anhydrous hydrobromic acid |
| Chemical formula: | HBr |

 Workplace exposure standard (interim)

| TWA: | **—** |
| --- | --- |
| STEL: | **2 ppm (6.6 mg/m3)** |
| Peak limitation: | **—** |
|  Notations: | **—** |
| IDLH: | **30 ppm** |
| **Sampling and analysis:** The recommended value is quantifiable through available sampling and analysis techniques.  |

## Recommendation and basis for workplace exposure standard

An interim STEL of 2 ppm (6.6 mg/m3) is recommended to protect for eye and respiratory tract irritation.

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

## Discussion and conclusions

Hydrogen bromide gas is used in certain processes to dissolve ores, in the manufacture of bromides and can form during accidental pyrolysis of bromo-fluorohydrocabons.

Limited data are available. Based on the available data, the critical effects of exposure are eye and respiratory tract irritation. A study in volunteers reported a NOAEC of 2 ppm and LOAEC of 3 to 4 ppm for irritation following exposure for a few minutes (SCOEL, 1992). Conflicting classifications from ACGIH (Peak Limitation), SCOEL (STEL) and DFG (TWA) are all 2 ppm, and indicate a further review is required to identify the most suitable parameter to protect for critical effects linked to long term exposure.

Given that the health effects associated with acute exposure are not severe nor critical, and the limited available data, a STEL of 2 ppm is recommended in the interim based on the reported NOAEC of 2 ppm for irritation 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: 3 ppm (9.9 mg/m3) (Peak limitation) |
|  |
| ACGIH 2004 TLV-Ceiling: 2 ppm (6.6 mg/m3) |
| TLV-Ceiling recommended to minimise acute irritation (based on similarity to HCl effects).TLV-Ceiling recommended based on policy: primary irritants with no known chronic effects should have ceiling.Summary of Data:Limited data available. Corrosive non-flammable gas with acrid irritating odour. No evidence of systemic health impact through dermal contact. No carcinogenicity or genotoxicity studies identified.Human data:* Case studies of chemical pneumonitis reported (limited data)
* Evidence of chemical burns in eye, skin and mucous membranes
* No evidence of reproductive or developmental toxicity effects.

Animal data:* Inhalation LC50: 2,860 ppm (rats; 1 h); 815 ppm (rats, 1 h)
* Rats exposed at 1,300 ppm for 30 mins developed severe necrohaemorrhagic rhinitis.
 |
| DFG 2010 MAK: 2 ppm (6.7 mg/m3) |
| Limited data for MAK recommendation available in 2010 document update. Classified for prenatal toxicity – revised to Pregnancy Risk Group D (2006).Additional information from MAK Value Determination (1999) supports the MAK; limited published data from long term studies noted.Human data:* Case studies indicate long term exposure to vapours (unknown concentration) caused decalcification of teeth and gum changes
* Skin contact at high (unknown) concentrations may cause dermatitis.
 |
| SCOEL 1992 STEL (15 mins): 2 ppm (6.7 mg/m3) |
| Critical effect identified as local irritation of skin, eyes and upper respiratory tract.Human data:* Odour threshold ≈2 ppm
* NOAEL 2 ppm (6.7 mg/m3) based on exposures at 3–4 ppm for “several” minutes
* LOAEL 3-4 ppm for irritation of nose and throat.
 |
| OARS/AIHA NA NA |
| No report. |
| HCOTN NA NA |
| No report. |

### Secondary source reports relied upon

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| NICNAS |  | N.D. | * Hydrobromic acid: Human health tier I assessment only.
 |

### 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? | Yes |
| --- | --- |

## Additional information

| Molecular weight: | 80.92 |
| --- | --- |
| 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.

Deutsche Forschungsgemeinschaft (DFG) (1999) Hydrogen bromide – MAK value documentation.

Deutsche Forschungsgemeinschaft (DFG) (2010) Hydrogen bromide – MAK value documentation.

EU Scientific Committee on Occupational Exposure Limits (SCOEL) (1992) Recommendation from the Scientific Committee on Occupational Exposure Limits for hydrogen bromide. SEG/SUM/21A.

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (N.D.) Hydrobromic Acid: Human health tier I assessment – IMAP report.

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