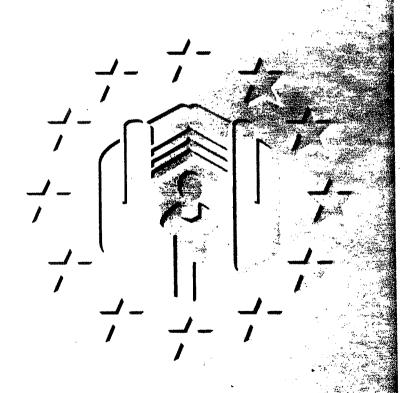


Occupational exposure limits

Recommendations of the Scientific Expert Group 1991-92



Health and safety

Hydrogen bromide

8-hour TWA:

STEL (15 minutes):

2 ppm (6.7 mg/m³)

Additional classification: -

Substance

Hydrogen bromide

HBr

Synonym:

hydrobromic acid

Einecs No:

233-113-0

EEC No:

035-002-00-0; Classification: C; R35 Xi; R37

CAS No:

10035-10-6

MWt:

80.92

Conversion factor (20°C, 101 kPa): 3.37 mg/m³ = 1 ppm

Occurrence/use

Hydrogen bromide is a colourless gas at ambient temperature and pressure with a strong, irritating odour. It has a melting-point of - 89°C, a boiling-point of - 67°C and a vapour pressure of 2 198 kPa at 20°C. It has a vapour density of 2.8 times that of air. The odour threshold is about 2 ppm (6.7 mg/m³).

Hydrogen bromide is found only in chemical processes. The production rate of hydrobromic acid in the European Community is in the order of 50 000 tonnes per annum. It is produced by direct reaction of bromine and hydrogen, as a by-product during bromination of the organic compound, and from sea water. It is used in the production of inorganic and organic bromides as intermediates for many chemical syntheses. It is commercially available as an aqueous solution or as a liquefied gas.

Health significance

Data on occupational exposure and animal studies of the toxicity of hydrogen bromide are extremely limited. The critical effect is local irritancy of the skin, eyes and upper respiratory tract. Irritation of the nose and throat was reported in human volunteers exposed to hydrogen bromide for 'several' minutes at 3 to 4 ppm (10 to 13 mg/m³) (CSDH, 1955). A NOAEL of 2 ppm (6.7 mg/m³) was concluded.

There are no available animal toxicity data relevant for setting exposure levels. There is also an absence of mutagenicity data.

Recommendation

The CSDH study of hydrogen bromide exposure to human volunteers was the only available basis for proposing exposure limits. This study identified a NOAEL of 2 ppm (6.7 mg/m³), with a LCAEL for irritation of 3 to 4 ppm (10 to 13 mg/m³). On the basis of these data the SEG recommended a STEL (15 minutes) of 2 ppm (6.7 mg/m³) to prevent exposure to irritant levels. The lack of longer term exposure data, in either animals or man, does not permit proposal of an 8-hour TWA.

It should be noted that the recommended limit is close to the current limit of detection.

Key bibliography

Basilico, S. and Garlanda, T., 'Occupational exposure limits. Criteria document for hydrogen bromide', EUR 14532, Milan.

CSDH (Connecticut State Department of Health, Hartford) (1955), unpublished data (as cited in HSDB/DIMDI databank on line, 1990).

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