METHYLAMINE

CAS number: 74-89-5

Synonyms: Aminomethane, methanamine, monomethylamine

Chemical formula: CH_5N

Structural formula: —

Workplace exposure standard (interim)

TWA: **10 ppm (13 mg/m^3)**

STEL: **15 ppm (19 mg/m^3)**

Peak limitation: **—**

Notations: **—**

IDLH: **100 ppm**

Sampling and analysis: The recommended value is quantifiable through available sampling and analysis techniques.

Recommendation and basis for workplace exposure standard

A TWA of 10 ppm (13 mg/m^3) is recommended to protect for irritation of the upper respiratory tract, skin and eyes in exposed workers.

A STEL of 15 ppm (19 mg/m^3) is recommended to protect for acute irritation of the upper respiratory tract, skin and eyes in exposed workers.

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

Discussion and conclusions

Methylamine is a chemical intermediate used in pharmaceuticals, insecticides, explosives, surfactants and accelerators.

The critical effects of exposure are irritation of the upper respiratory tract, skin and eyes.

In humans, brief exposure at 20 to 100 ppm produced transient eye, nose and throat irritation but no irritation observed at 10 ppm (ACGIH, 2018). A short-term repeated inhalation study in rats reported LOAEC of 75 ppm based on local irritation in the respiratory tract. A LOAEC of 250 ppm for systemic effects is reported in same study (ACGHI, 2018; ECHA, 2006). The DFG (1996) provided a MAK of 10 ppm based on analogy with ethylamine (DFG, 1996).

Based on the limited information, the LOAEC of 10 ppm in humans for transient irritation effects and the MAK by DFG (1996), it is recommended the SWA TWA of 10 ppm be retained in the interim. Given that transient irritation effects in humans were reported following brief exposure at 20 ppm, a STEL of 15 ppm is recommended.

A broader evaluation of additional data sources is recommended at the next scheduled review.

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: 10 ppm (13 mg/m^3)***
ACGIH	***2013***	***TLV-TWA: 5 ppm (6.4 mg/m^3); TLV-STEL: 15 ppm (19 mg/m^3)***
TLV-TWA and TLV-STEL recommended to minimise the potential for irritation of the eyes, skin and upper respiratory tract. Summary of data: • No specific derivation provided. Based on no irritation reported in humans with transient exposures at <10 ppm. Human data: • Brief exposure at 20–100 ppm produced transient eye, nose and throat irritation: ○ no irritation at 10 ppm; no further information. Animal data: • Acute exposure produces severe irritation to the eyes and skin of laboratory animals; no further information • LC_{50}: 2,400 mg/m^3 (mice, 2 h) • Rats exposed 6 h/d, 5 d/wk for 2 wk; marginal respiratory tract pathology at 75 ppm.		
DFG	***1996***	***MAK: 10 ppm (13 mg/m^3)***
MAK established in 1966 in analogy with the value for ethylamine to prevent mucosal irritation. Summary of additional data: Human data: • Odour threshold between 0.008–11 ppm. Animal data: • RD_{50}:140 ppm (mice).		
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	✓	2006	• LOAEC of 75 ppm; short-term repeated inhalation in rats; local irritation in respiratory tract: o LOAEC of 250 ppm for systemic effects (cited by ACGIH, 2013).

Carcinogenicity — non-threshold based genotoxic carcinogens

Is the chemical mutagenic? No

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

Notations

Source	Notations
SWA	—
HCIS	—
NICNAS	NA
EU Annex	NA
ECHA	—
ACGIH	—
DFG	—
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:	31.05
Conversion factors at 25°C and 101.3 kPa:	1 ppm = 1.28 mg/m^3; 1 mg/m^3 = 0.789 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.

Deutsche Forschungsgemeinschaft (DFG) (2002) Methylamin – MAK value documentation.

European Chemicals Agency Regulation (ECHA) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

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