METHYL ACETYLENE

CAS number: 74-99-7

Synonyms: Allylene, Propyne

Chemical formula: C_3H_4

Workplace exposure standard (retained)

TWA: **1,000 ppm (1,640 mg/m^3)**

STEL: **—**

Peak limitation: **—**

Notations: **—**

IDLH: **1,700 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 1,000 ppm (1,640 mg/m^3) is recommended to protect for anaesthesia in exposed workers.

Discussion and conclusions

Methyl acetylene is used as a welding torch fuel, a chemical intermediate and propellant.

The critical effect of exposure is anaesthesia. The toxicological database is very limited and indicates low acute toxicity (ACGIH, 2018). Appropriate chronic exposure studies in animals or humans are not reported in the available source material. A subchronic animal inhalation study (rats and dogs) caused anaesthetic effects and pulmonary irritation at 28,700 ppm and resulted in fatalities (ACGIH, 2018).

The TWA of 1,000 ppm is recommended to be retained as it is expected to be protective of these effects.

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: 1,000 ppm (1640 mg/m^3)***
ACGIH	***2017***	***TLV-TWA: 1,000 ppm (1640 mg/m^3)***

TLV-TWA recommended to minimise the risk of anaesthesia in exposed workers.
Summary of data:
Animal data:
• 42,000 ppm (rats, inhalation) produced hyper-activity
  ○ 7 min: lethargy and ataxia
  ○ 95 min: anaesthesia
  ○ no fatalities after 5 h
• 28,700 ppm (average exposure; dogs, rats, 6 h/d, 5 d/wk, 6 mo)
  ○ symptoms included excitement, ataxia, salivation, mydriasis, tremors, reduced weight gain and signs of pulmonary irritation
  ○ exposure fatal to 8/20 rats and 0/2 dogs.
 	
Insufficient data to recommend a skin, sensitiser or carcinogen notation.		

DFG	***2000***	***Not assigned***
Experiences in humans and animals, which are suitable for the derivation of a MAK value, not available. • Led to mutations in assays on *E. coli* strain WP2uvrA • Negative in *S. typhimurium* strains TA98, TA100, TA1535, and TA1537 assays.		
SCOEL	***NA***	***NA***
No report.		
OARS/AIHA	***NA***	***NA***
No report.		
HCOTN	***2004***	***TWA: 1,000 ppm (1650 mg/m^3)***
The committee concludes that, based on the mortality observed in the 6-mo inhalation study, the present TWA of 1,000 ppm (1,650 mg/m^3), may be too high. • 100,000-150,000 ppm (rats, cats, inhalation) induced anaesthesia, cardiac irregularities and convulsions.		

Secondary source reports relied upon

Source		Year	Additional information
ECHA	✓	2018	No additional information

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	—
HCIS	NA
NICNAS	NA
EU Annex	NA
ECHA	NA
ACGIH	—
DFG	—
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

There are insufficient data to recommend a skin notation.

IDLH

Is there a suitable IDLH value available?	Yes, based on LEL

Additional information

Molecular weight:	40.06
Conversion factors at 25°C and 101.3 kPa:	1 ppm = 1.64 mg/m^3; 1 mg/m^3 = 0.611 ppm
This chemical is used as a pesticide:	☐
This chemical is a biological product:	☐

Molecular weight:	40.06
Conversion factors at 25°C and 101.3 kPa:	1 ppm = 1.64 mg/m^3; 1 mg/m^3 = 0.611 ppm
This chemical is used as a pesticide:	☐
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) (2000) Methylacetylen – 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).

Health Council of the Netherlands (HCOTN) (2004) Propyne. Health-based Reassessment of Administrative Occupational Exposure Limits. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/128.

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