

METHYLCYCLOHEXANOL (ALL ISOMERS)

CAS number: 25639-42-3

Synonyms: Hexahydrocresol, methylhexalin

Chemical formula: C₇H₁₄O

Structural formula: —

Workplace exposure standard (retained)

TWA: 50 ppm (234 mg/m³)

STEL: —

Peak limitation: —

Notations: —

IDLH: 500 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 50 ppm (232 mg/m³) is recommended to protect for respiratory tract irritation and liver and kidney effects in exposed workers.

Discussion and conclusions

Methylcyclohexanol has been used in various applications including as a solvent for cellulose esters and ethers, a lubricant antioxidant and a blending agent for soaps and detergents. It is also used in the textile and artificial silk industry and as a degreasing agent.

The critical effects of exposure are irritation of the respiratory tract and liver and kidney effects.

In humans, a concentration of 500 ppm can cause upper respiratory tract irritation. This concentration is reported as the odour threshold (HCOTN, 2000). A LOAEC of 560 mg/m³ (reported as 121 ppm by ACGIH and 118 by HCOTN) is identified in an inhalation study in rabbits based on slight microscopic changes in the liver and kidneys following ten weeks of exposure. This was the lowest exposure concentration in the study (ACGIH, 2018; HCOTN, 2000). The ACGIH (2018) based the recommended TLV-TWA of 50 ppm on this LOAEC; no specific derivation was described. HCOTN (2000) recommended an OEL of 10.5 ppm by applying different uncertainty factors based on this same LOAEC, while the published administrative OEL by HCOTN is 50 ppm.

The SWA TWA of 50 ppm (323 mg/m³), by ACGIH (2018), is recommended to be retained. The recommended TWA is considered protective for irritation effects and effects on the liver and kidneys in exposed workers.

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.

DRAFT

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	1991	TWA: 50 ppm (234 mg/m³)
ACGIH	2001	TLV-TWA: 50 ppm (234 mg/m³)
<p>TLV-TWA recommended to minimise the potential for eye and mucous membrane irritation and for histologic changes in the liver and kidneys in workers.</p> <p>Summary of data:</p> <p>No derivation of TLV-TWA provided.</p> <p>Human data:</p> <p>No human data presented.</p> <p>Animal data:</p> <ul style="list-style-type: none"> LD₅₀: 1.25 g/kg (rabbits, oral); acute parenchymal and vascular damage in the heart, liver and kidneys and vascular damage in the lungs; sub-lethal dose showed liver damage Rabbits exposed at 121, 232 or 503 ppm 6 h/d, 5 d/wk, for 10 wk: <ul style="list-style-type: none"> exposure at 121 ppm (560 mg/m³) showed barely detectable microscopic tissue changes in the liver and kidneys authors of the study concluded that the maximum, safe, long-term concentration for rabbits reported as slightly <120 ppm Repeated cutaneous application of 6.8, 9.4 or 16.6 g/kg resulted in skin irritation; at highest doses resulted in weakness, tremor, narcosis and death. 		
DFG	1998	Not assigned
Insufficient data to recommend a health-based MAK value.		
SCOEL	NA	NA
No report.		
OARS/AIHA	NA	NA
No report.		
HCOTN	2000	TWA: 50 ppm (235 mg/m³)
<p>Current TWA is an administrative OEL</p> <p>Summary of additional data:</p> <ul style="list-style-type: none"> In humans, a concentration of 500 ppm (2,375 mg/m³) can cause upper respiratory irritation; equivalent to odour threshold; no further information Based on data from the 10 wk study of rabbits (as cited by ACGIH, 2018), the committee considers the LOAEC to be 560 mg/m³ (118 ppm) (reported as 121 ppm by ACGIH, 2018): <ul style="list-style-type: none"> this LOAEC is used as the starting point for the health-based OEL recommendation In review of the assigned administrative TWA a recommendation is made regarding the potential for a HBROEL: <ul style="list-style-type: none"> start with the LOAEC of 560 mg/m³ apply an UF of 18 to the LOAEL to account for lack of NOAEL and inter- and intraspecies uncertainty 		



Source	Year set	Standard
		<ul style="list-style-type: none"> ○ results in 31 mg/m³ rounded up to 50 mg/m³ (10.5 ppm) according to HCOTN methodology to recommend TWA OEL.

Secondary source reports relied upon

NIL.

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	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

Calculation

Insufficient data to assign a skin notation

IDLH

Is there a suitable IDLH value available?

Yes



Additional information

Molecular weight:	114.19
Conversion factors at 25°C and 101.3 kPa:	1 ppm = 4.66 mg/m ³ ; 1 mg/m ³ = 0.215 ppm
This chemical is used as a pesticide:	<input type="checkbox"/>
This chemical is a biological product:	<input type="checkbox"/>
This chemical is a by-product of a process:	<input type="checkbox"/>
A biological exposure index has been recommended by these agencies:	<input type="checkbox"/> ACGIH <input type="checkbox"/> DFG <input type="checkbox"/> 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) (1998) methylcyclohexanol (alle isomeren) – MAK value documentation.

Health Council of the Netherlands (HCOTN) (2000) Methylcyclohexanol (mixed isomers). Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/010.

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