



TRICHLORONAPHTHALENE

CAS number: 1321-65-9

Synonyms: Halowax, nibren wax, seekay wax

Chemical formula: C₁₀H₅Cl₃

Workplace exposure standard (amended)

TWA: —

STEL: —

Peak limitation: —

Notations: Sk.

IDLH: —

Sampling and analysis: N/A

Recommendation and basis for workplace exposure standard

This chemical has been nominated for removal from the *Workplace exposure standards for airborne contaminants* (WES) due to a lack of evidence that it is used or generated in Australian workplaces or that it presents a potential for legacy exposure. Therefore, a TWA is not recommended.

Discussion and conclusions

Trichloronaphthalene is primarily used in lubricant and insulation for electrical wire. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure.

The critical effects of exposure are chloracne and liver injury.

Limited data exists from human and animal studies. A non-fatal case of hepatitis reported in a worker exposed at 3 mg/m³ for an unknown duration (ACGIH, 2018). Inhalation exposure in rats at 1.3 ppm for 16 hours per day over two and a half months caused slight swelling of the liver (ACGIH, 2018). Liver damage is reported in factory workers after long-term inhalation exposure at 2.4 to 4.9 mg/m³ (concentrations determined in simulation of the exposure conditions) (DFG, 1999). ACGIH (2018) and DFG (HCOTN (1995) recommended occupational exposure limits of 5 mg/m³ based on comparison to other chloronaphthalenes. HCOTN stated that the administrative TWA of 5 mg/m³ is at least 10 times to high, but there are insufficient data to derive an HBROEL.

This chemical has been nominated for removal from the WES list. A TWA is not recommended.

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.

A skin notation is recommended due to evidence of dermal absorption and contribution to adverse systemic effects in humans.

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	1991	TWA: 5 mg/m³
ACGIH	2001	TLV-TWA: 5 mg/m³
TLV-TWA recommended to minimise the risk of liver injury and chloracne. Summary of data: TLV- TWA assigned based on comparison to other chloronaphthalenes. Human data: - Industrial experience indicates chloracne as a symptom of dermal exposure - Volunteers exposed to mist showed trichloronaphthalene to be non-allergenic as compared to pentachloronaphthalene and hexachloronaphthalene - Worker exposure at 3 mg/m³ (inhalation) resulted in a non-fatal case of hepatitis (duration unknown). Animal data: - Exposure at 15 mg/kg/d (rabbits, 2 mo, subcutaneous), no adverse effects observed - Exposure at 11 mg/m³ (rats, 16 h/d, 2.5 mo, inhalation) caused hepatic hypertrophy and granulocytosis: 1.3 mg/m³ for 4 mo caused slight swelling of the liver - No adverse effects observed calves exposed at 16 and 26 mg/kg/d (7–10 d, oral): - slightly higher concentrations of tetrachloronaphthalene caused mild hyperkeratosis - similar or lower concentrations of pentachloronaphthalene and hexachloronaphthalene caused signs of intoxication - Chlorinated naphthalenes reported absorption through animal skin (no further information provided). Skin notation assigned based on evidence of dermal absorption. Insufficient data to recommend a sensitiser or carcinogen notation.		
DFG	1999	Not assigned
Due of the lack of data, the possibility cannot be excluded that a MAK value at 1 mg/m³ may not prevent liver damage in individual persons. Summary of additional data: Liver damage reported in factory workers after long-term inhalation exposure at 2.4–4.9 mg/m³ and pentachloronaphthalene concentrations of 0.5–1.0 mg/m³ (concentrations determined in simulation of the exposure conditions).		
SCOEL	NA	NA
No report.		
OARS/AIHA	NA	NA
No report.		



Source	Year set	Standard
HCOTN	2001	TWA: 5 mg/m³
The committee considers the data base too poor to justify recommendation of a HBROEL. Based on the slight liver injury observed in a sub-chronic inhalation study in rats with concentrations of ≈ 1 and 11 mg/m ³ , the present MAC value of 5 mg/m ³ is at least one order of magnitude too high.		

Secondary source reports relied upon

Source	Year	Additional information
NICNAS	✓ 2002	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	Skin
EU Annex	NA
ECHA	NA
ACGIH	Skin
DFG	H (skin)
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

Adverse effects in human case study:
Dermal LD₅₀ ≤ 1000 mg/kg:
Dermal repeat-dose NOAEL ≤ 200 mg/kg:
Dermal LD₅₀/Inhalation LD₅₀ < 10:
In vivo dermal absorption rate > 10%:
Estimated dermal exposure at WES > 10%:

yes

a skin notation is warranted

IDLH

Is there a suitable IDLH value available? No

Additional information

Molecular weight:	231.51
Conversion factors at 25°C and 101.3 kPa:	1 ppm = Number mg/m ³ ; 1 mg/m ³ = 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](#) on the ACGIH website.

Deutsche Forschungsgemeinschaft (DFG) (1999) Chlorinated naphthalenes – MAK value documentation.

Health Council of the Netherlands (HCOTN) (2001) Trichloronaphthalene. Health-based Reassessment of Administrative Occupational Exposure Limits. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/029.

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (2002) Polychlorinated naphthalenes: Targeted Assessment.

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



DRAFT