

PENTACHLORONAPHTHALENE

CAS number: 1321-64-8

Synonyms: Halowax 1013

Chemical formula: $C_{10}H_3Cl_5$

Structural formula: —

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* 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

Pentachloronaphthalene is used in electric wire insulation and as an additive to some lubricants. 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 effect of exposure is liver damage.

Limited data exists in humans and animals. Chlorinated naphthalenes produce acne-like lesions (chloracne) and may be absorbed through the skin. Cases of toxic hepatitis were reported following exposure to pentachlorinated naphthalenes. However, specific exposure information is not provided. Authors of a study in 59 workers exposed to tetra- and pentachloronaphthalene vapour reported dermatoses consistent with chloracne resulting from skin contact in all workers examined. Systemic symptoms including headache, fatigue, vertigo and anorexia were also noted. Effects on the liver following exposure to concentrations of 1.16 to 1.44 mg/m³ were reported in sub-chronic inhalation studies in rats; with effects described as definite liver injury and hepatic changes, respectively (ACGIH, 2018).

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 through intact skin which can contribute to total body burden and dermatitis in humans.

DRAFT

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	1991	TWA: 0.5 mg/m³
ACGIH	2001	TLV-TWA: 0.5 mg/m³
<p>TLV-TWA recommended to minimise the potential for liver damage and for dermatitis in the form of chloracne.</p> <p>Summary of data:</p> <p>OEL is based animal inhalation data and a recommendation of 0.5 mg/m³ as a safe limit by the authors of the studies; no specific derivation provided.</p> <p>Human data:</p> <ul style="list-style-type: none"> • 9 case reports of toxic hepatitis due to exposure to various chlorinated naphthalenes; no further information • 7 cases of toxic hepatitis, 2 fatal following exposure to pentachlorinated naphthalenes; no further information • Study in 59 workers exposed to tetra- and pentachloronaphthalene vapours: <ul style="list-style-type: none"> ○ 56 workers showed dermatoses consistent with chloracne resulting from skin contact ○ systemic symptoms include headache, fatigue, vertigo and anorexia ○ no further information. <p>Animal data:</p> <ul style="list-style-type: none"> • Toxicity of chlorinated naphthalenes increased with the degree of chlorination • Hepatic changes in rats following 143 x 8 h exposures at 1.44 mg/m³; mixture of penta- and hexachloronaphthalenes; no further information • Liver injury in rats exposed to mixture of hexa- and pentachloronaphthalene vapours at average concentration of 1.16 mg/m³ for 16 h d for up to 4.5 mo • Authors of the studies in rats recommend 0.5 mg/m³ as a safe limit for pentachloronaphthalene. 		
DFG	1999	Not assigned
<p>No MAK assigned.</p> <p>Reviewed as part of chlorinated naphthalenes group.</p> <p>No further data.</p>		
SCOEL	NA	NA
No report.		
OARS/AIHA	NA	NA
No report.		
HCOTN	2001	TWA: 0.5 mg/m³
<p>Administrative OEL.</p> <p>Insufficient data to recommend a health-based OEL.</p> <p>No further information.</p>		

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	NA
HCIS	NA
NICNAS	NA
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:

yes

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%:

a skin notation is warranted

IDLH

Is there a suitable IDLH value available?

No



Additional information

Molecular weight:	300.4
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:	<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) (1999) Chlorinated naphthalenes – MAK value documentation.

Health Council of the Netherlands (HCOTN) (2001) Pentachloronaphthalene. Health-based Reassessment of Administrative Occupational Exposure Limits. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/025.

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