



PROPARGYL ALCOHOL

CAS number: 107-19-7

Synonyms: Acetylene carbinol, propiolic alcohol, 2-propyn-1-ol

Chemical formula: C_3H_4O

Workplace exposure standard (retained)

TWA: 1 ppm (2.3 mg/m³)

STEL: —

Peak limitation: —

Notations: Sk.

IDLH: —

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 ppm (2.3 mg/m³) is recommended to protect for potential liver and kidney damage and local irritation in exposed workers.

Discussion and conclusions

Propargyl alcohol is used in steel production, chemical manufacture, as a corrosion inhibitor, solvent stabiliser and soil fumigant.

Critical effects of exposure are liver and kidney damage and eye and skin irritation.

No human exposure data are available. A NOAEC of 5 ppm for increased weight of liver and kidney is reported for sub-chronically exposed rats (DFG, 2005; HCOTN, 2004). Irritation of mucous membranes is reported above 8 and 16 ppm in a chronic inhalation study with mice and rats, respectively (ECHA, 2020).

In the absence of human exposure data, the available animal data and toxicological similarity to allyl alcohol are considered for the recommendation. The SWA TWA of 1 ppm derived by ACGIH (2018) is recommended to be retained and is expected to be protective of the critical effects of liver and kidney damage and eye and skin irritation.

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 for dermal absorption and contribution to adverse systemic effects in animals.

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	1991	TWA: 1 ppm (2.3 mg/m³)
ACGIH	2001	TLV-TWA: 1 ppm (2.3 mg/m³)
TLV-TWA intended to protect for eye and skin irritation and liver and kidney damage. Skin notation recommended based on systemic effects from dermal absorption in rabbits. Summary of data: TLV-TWA based on analogy to allyl alcohol due to structural and toxicological similarities; relevant information for allyl alcohol is provided in the agency's evaluation. The TLV-TWA is twice that of allyl alcohol. Human data: • None presented. Animal data: • Oral LD₅₀: 20–93 mg/kg (rats); 60 mg/kg (guinea pigs); 50 mg/kg (mice) • LC₅₀: 1,040–1,200 ppm (rats, 1 h): - o LC₅₀ for allyl alcohol: 165 ppm (rats, 4 h) - o oral LD₅₀ for allyl alcohol: 64 mg/kg (rats) • LD₅₀: 88 mg/kg (rabbits, single dose dermal); undiluted substance caused hyperaemia and superficial necrosis • Non-sensitising to skin (rabbits, no further details provided) • 1% solution non-irritating to eyes (rabbits); 10% solution caused slight irritation • Transient eye irritation, increased liver and kidney weights, and histopathological hepatic and renal degeneration at 80 ppm in sub-chronic inhalation study (rats, 7 h/d, 5 d/wk, 3 mo) • No mutagenicity, carcinogenicity or ADME data presented. Insufficient data to assign a TLV-STEL or notations for carcinogenicity and sensitisation.		
DFG	1969	MAK: 2 ppm (4.7 mg/m³)
Summary of additional data: MAK derived from animal exposure data in the absence of suitable human data. Target organs in animals after repeated oral or inhalational doses were liver, kidneys, and blood. A NOAEC of 5 ppm for increased liver and kidney weights reported in sub-chronically exposed rats; 1969 MAK of 2 ppm therefore, considered protective of these effects and retained. Skin notation recommended based on appreciable dermal absorption in animals. Human data: • No data available. Animal data: • LC₅₀: 2,000 (rats, 2 h); acute symptoms were shortness of breath, prostration, irritation, hyperaemia and bleeding in internal organs • Increased liver and kidney weights (no histopathological changes noted) at 25 ppm in sub-chronic inhalation study with exposure groups 0, 1, 5, 25 ppm (rats, 6 h/d, 5 d/wk, 90 d):		

Source	Year set	Standard
- o NOAEC: 5 ppm • Duration-dependent, but not dose-dependent, histopathological degeneration of nasal epithelium at 25 and 88 ppm (mice, 6 h/d, 4, 9 or 14 d): - o no changes noted in trachea or lungs • Similar pathologies to those in inhalation studies observed in repeat gavage studies >1–5 mg/kg/d (rats, 14–90 d): - o NOAELs of 1–5 mg/kg/d for increased liver and kidney weights reported in 2 studies (rats, 4 and 13 wk, respectively) • No exposure-related effects up to 10 mg/kg/d (highest tested dose) in repeat dermal dose study with exposure range: 1–10 mg/kg/d (rabbits, 8 h/d, 5 d/wk, 91 d) • Non-mutagenic <i>in vitro</i> in bacteria, weak clastogenic activity in Chinese hamster ovarian cells, agency notes that investigation into clastogenicity due to aldehyde formation not reported • Non-mutagenic and non-clastogenic <i>in vivo</i> in micronucleus from single gavage dose at 70 mg/kg (mice) • No ADME data available. Insufficient data to assign notations for carcinogenicity or sensitisation.		
SCOEL	NA	NA
No report.		
OARS/AIHA	NA	NA
No report.		
HCOTN	2004	TWA 8 hours: 1 ppm (2 mg/m³)
Summary of additional information: Current administrative OEL considered too high, HBROEL derived from NOAEC of 5 ppm for increased liver and kidney weights reported in sub-chronically exposed rats (study also cited in DFG, 2005). An overall UF of 18 is applied to account for inter- and intraspecies differences, and the duration of exposure to afford an HBROEL of 0.2 ppm. Cumulative effects are not expected based on comparison of 4 wk and 13 wk oral dose studies (studies also cited in DFG, 2005). Skin notation recommended based on systemic effects in rabbits following dermal exposure. Human data: • No data available. Animal data: • 56–60% of oral dose excreted in urine within 96 h (rats, mice) • No carcinogenicity data available.		

Secondary source reports relied upon

Source	Year	Additional information
US EPA	✓ 1990	• Oral RfD based primarily on NOAEL of 5 mg/kg/d for increased liver and kidney weights reported in sub-chronic gavage study with exposure groups 0, 5, 15, 50 mg/kg/d (rats, 90 d, also cited in DFG, 2005) • Inhalational RfD and carcinogenic risk not yet assessed.



Source	Year	Additional information
ECHA	✓ 2020	- Non-carcinogenic based on non-significant incidence of nasal epithelial adenomas reported in chronic inhalation studies (mice, rats, 6 h/d, 5 d/wk, 2 yr): - high mortality at 32 (26/50) and 64 ppm (30/50) due to excessive lethargy (rats) - LOAEC: 8 ppm (mice), 16 ppm (rats) for nasal lesions at 16 ppm (rats, lowest tested dose) - Mild hyperplasia of nasal epithelium >16 ppm compared to controls in subchronic inhalation study with exposure groups 0, 4, 8, 16, 32, 64 ppm (rats, 6 h/d, 5 d/wk, 3 mo): - NOAEC: 8 ppm - DNEL adopted from DFG (2005) MAK; local irritation endpoint less sensitive than systemic endpoints in rats.
US NIOSH	✓ 2014	- Insufficient data to assign sensitiser notation 1.58% solution at 15.8 mg/kg or 31.6 mg/kg for 24 h was lethal to 1 of 2 rabbits; diarrhoea and hyperaemia observed, no signs of toxicity at 8 mg/kg - SK:SYS notation recommended based on lethal systemic effects following dermal absorption in animals.

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	Skin
HCIS	—
NICNAS	NA
EU Annex	—
ECHA	—
ACGIH	Skin
DFG	H (skin)
SCOEL	NA
HCOTN	Skin
IARC	NA
US NIOSH	SK:SYS

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: **yes**
 Dermal repeat-dose NOAEL ≤ 200 mg/kg: **yes**
 Dermal LD₅₀/Inhalation LD₅₀ < 10: **yes**
In vivo dermal absorption rate > 10%:
 Estimated dermal exposure at WES > 10%:

consider assigning a skin notation

IDLH

Is there a suitable IDLH value available? No

Additional information

Molecular weight: 56.06

Conversion factors at 25°C and 101.3 kPa: 1 ppm = 2.29 mg/m³; 1 mg/m³ = 0.437 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
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[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) (2005) Propargyl alcohol – MAK value documentation.

European Chemicals Agency (ECHA) (2019) Prop-2-yn-1-ol – REACH assessment.

Health Council of the Netherlands (HCOTN) (2004) Prop-2-yn-1-ol. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/137.

US National Institute for Occupational Safety and Health (NIOSH) (2014) NIOSH Skin Notation Profiles: Propargyl alcohol.

US Environmental Protection Authority (US EPA) (1990) Integrated Risk Information System (IRIS) Chemical Assessment Summary – Propargyl alcohol.