

ISOPROPYLAMINE

CAS number: 75-31-0

Synonyms: 2-Aminopropane, 2-propamine

Chemical formula: C_3H_9N

Structural formula: —

Workplace exposure standard (retained)

TWA: 5 ppm (12 mg/m³)

STEL: 10 ppm (24 mg/m³)

Peak limitation: —

Notations: Sk.

IDLH: 750 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 5 ppm (12 mg/m³) is recommended to protect for eye, nose and respiratory irritation in exposed workers.

A STEL of 10 ppm (24 mg/m³) is recommended to protect for eye, nose and respiratory irritation in acute exposures.

Discussion and conclusions

Isopropylamine is primarily used as a solvent, depilatory, solubiliser and a chemical intermediate.

Critical effects of exposure are eye, nose and respiratory irritation. Limited data in humans suggest that brief exposure at 10 to 20 ppm (24 to 48 mg/m³) resulted in nose and throat irritation (upper respiratory tract) (ACGIH 2018). It is irritating in humans at concentrations of 10 to 20 ppm. A sub-chronic inhalation study in rats resulted in a NOEC of 41 ppm for eye, nose and respiratory irritation (DFG 1958).

The TWA of 5 ppm from primary sources (ACGIH, 2018; DFG 1958; HCOTN, 2004) and STEL of 10 ppm are recommended to be retained. The TWA is expected to be protective of irritation effects in the eyes and upper respiratory tract as identified in the sub-chronic inhalation study in rats. The STEL is protective of irritation in acute exposures at 10 to 20 ppm in humans.

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 based on evidence of dermal absorption in animals.

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	1991	TWA: 5 ppm (12 mg/m³); STEL: 10 ppm (24 mg/m³)
ACGIH	2001	TLV-TWA: 5 ppm (12 mg/m³); TLV-STEL: 10 ppm (24 mg/m³)
<p>TLV-TWA recommended to minimise the risk of eye and respiratory irritation in exposed workers.</p> <p>Summary of data:</p> <p>Human data:</p> <ul style="list-style-type: none"> Brief exposure at 10–20 ppm resulted in nose and throat irritation Mild corneal oedema resulted from 8 h exposure at unknown concentrations, symptoms usually cleared in 3–4 h. <p>Animal data:</p> <ul style="list-style-type: none"> Rats survived exposure at 4,000 ppm but died when exposed to 8,000 ppm, suggesting half the potency of butylamine Critical effects of inhalation exposure were respiratory tract irritation and potential pulmonary oedema. <p>Insufficient data to recommend a skin sensitiser or carcinogenicity notations.</p>		
DFG	1958	MAK: 5 ppm (12 mg/m³)
<p>MAK is recommended to protect for irritating effects in the upper respiratory tract.</p> <ul style="list-style-type: none"> LC₅₀: 571 ppm (1,400 mg/m³) (rats, 2 h) RD₅₀: 160 ppm (393 mg/m³) (mice, 15 min) LD₅₀: >400 mg/kg (rats, dermal) LD₅₀: 550–688 mg/kg (rabbit, dermal) Irritating to the upper respiratory tract in humans at concentrations of 10–20 ppm (24–48 mg/m³) Exposure at 42, 204, 377 and 551 ppm (rats, 6 h/d, GD 6–15, inhalation) produced a NOEC of 204 ppm, symptoms included mild rales in the lung, dyspnoea, perinasal, perioral encrustations and body weight decrease Exposure at 100, 500 and 1,350 mg/m³ (rats, 6 h/d, 5 d/wk, 4wk, inhalation) produced a NOEC of 100 mg/m³ (41 ppm): <ul style="list-style-type: none"> symptoms included sneezing, nasal encrustations, corneal opacities, reductions in body weight, reduced lymphocytes and eye, nose and respiratory irritation Exposure to 0, 20, 204, 408 ppm (rats, 6 h/d, GD 6–15, inhalation) symptoms included respiratory irritation, decreased body weight, skeletal variations and foetal weights: <ul style="list-style-type: none"> NOAEC maternal toxicity: 50 mg/m³ (20 ppm) NOAEC Developmental toxicity: 500 mg/m³ (200 ppm) Negative results in mutagenicity assays. 		



Source	Year set	Standard
SCOEL	NA	NA
No report.		
OARS/AIHA	NA	NA
No report.		
HCOTN	2004	TWA: 5 ppm (12 mg/m³)
Summary of additional data:		
<ul style="list-style-type: none"> LD₅₀: >5,000 mg/kg and 550–688 mg/kg Odour threshold of 0.2–1.2 ppm reported NOAEL of 100 mg/m³ in rats; 28 d study; irritation of the eyes and nose; unpublished. 		

Secondary source reports relied upon

Source	Year	Additional information
NICNAS	✓ 2016	<ul style="list-style-type: none"> No additional information.
ECHA	✓ 2011	<ul style="list-style-type: none"> Deemed not sensitising <i>in vivo</i> study on guinea pigs.

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	—
NICNAS	—
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

Adverse effects in human case study:	no
Dermal LD ₅₀ ≤1000 mg/kg:	yes
Dermal repeat-dose NOAEL ≤200 mg/kg:	
Dermal LD ₅₀ /Inhalation LD ₅₀ <10:	
<i>In vivo</i> dermal absorption rate >10%:	
Estimated dermal exposure at WES >10%:	
consider assigning a skin notation	

IDLH

Is there a suitable IDLH value available? Yes

Additional information

Molecular weight:	59.11
Conversion factors at 25°C and 101.3 kPa:	1 ppm = 2.41 mg/m ³ ; 1 mg/m ³ = 0.414 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) (2007) 2-Aminopropan (Isopropylamin) – MAK value documentation.

European Chemicals Agency (ECHA) (2011) Isopropylamine – REACH assessment.

Health Council of the Netherlands (HCOTN) (2004) Isopropylamine. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/122.

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (2016) Short chain (C2-3) alkyl amines: Human health tier II assessment – IMAP report.

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

DRAFT