AMITROLE

CAS number:	61-82-5
Synonyms:	3-Amino-1,2,4-triazole, amitrole, aminotriazole
Chemical formula:	$C_2H_4N_4$
Structural formula:	

Workplace exposure standard (retained)

TWA:	**0.2 mg/m^3**
STEL:	**—**
Peak limitation:	**—**
Notations:	**—**
IDLH:	**—**
Sampling and analysis:	The recommended value is readily quantifiable through currently available sampling and analysis techniques.

Recommendation and basis for workplace exposure standard

The TWA of 0.2 mg/m^3 is recommended to protect for adverse toxic effects on the thyroid gland of workers and possible effects on the foetus of pregnant women exposed at the workplace.

Discussion and conclusions

Amitrole is used as a herbicide and growth regulator for plants. Exposure to amitrole leads to effects on the thyroid gland and is responsible for the induction of thyroid cancers and reproductive toxicity in animals. The mechanism of the carcinogenic action is non-genotoxic.

Rats are generally considered to be especially sensitive and as such, amitrole is not expected to produce thyroid cancer in humans (ACGIH, 2018; SCOEL, 2009).

A NOEL of 0.025 mg/kg in rats, extrapolated directly for the human inhalation pathway, results in an airborne concentration of 0.2 mg/m^3. Given rats sensitivity to amitrole, no additional safety factor is considered necessary. This value is considered protective of thyroid effects in humans (SCOEL, 2009).

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.

Insufficient data available to recommend a skin notation.

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	***1995***	***TWA: 0.2 mg/m^3***
ACGIH	***2001***	***TLV-TWA: 0.2 mg/m^3***
TLV-TWA recommended to minimise the potential for adverse toxic effects on the thyroid and possible fetotoxicity. Summary of data: Amitrole is a herbicide and growth regulator for plants. Human data: • Oral dose of 100 mg inhibited thyroid uptake of Iodine-131 (^{131}I) for 24 h • Threshold dose affecting thyroid function: 0.15-0.2 mg/kg • Increased malignant neoplasms in workers exposed to combination of herbicides; however, inadequate to clearly evaluate. Animal data: • No systemic effects after dermal application of 10,000 mg/kg (rats and rabbits) • No irritation or systemic effects in rats after inhalation (439 mg/m^3, 4 h) • NOEL: 0.5 ppm (0.025 mg/kg/d); for ^{131}I uptake in rats by oral administration • Threshold dose affecting thyroid function is 0.05 mg/kg (rats) • Rats identified as a sensitive species for carcinogenicity • Dietary studies in rats resulted in hyperplasia and malignant tumours of the thyroid and pituitary • Negative results in mutagenic studies • Oral doses (diet) in rats of 500 and 1000 ppm were fetotoxic but not teratogenic. Insufficient data available to recommend Skin or SEN notations or a TLV–STEL.		
DFG	***2002***	***MAK: 0.2 mg/m^3***
MAK value recommended to protect for effects on the thyroid. No further data.		
SCOEL	***2009***	***TWA: 0.2 mg/m^3***
TWA recommended to protect for effects on the thyroid. Summary of additional data: • Not irritating in patch test with human volunteer exposed for 4 or 8 h • No local or systemic effects observed following dermal exposure in rabbits.		
OARS/AIHA	***NA***	***NA***
No report		
HCOTN	***NA***	***NA***
No report		

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	Carcinogenicity – A3
DFG	Carcinogenicity – 3B
SCOEL	Carcinogenicity – D
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
Insufficient data to assign a skin notation

IDLH

Is there a suitable IDLH value available?	No

Additional information

Molecular weight:	84.08
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:	☐

Molecular weight:	84.08
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:	✓
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) (2002) Amitrole – MAK value documentation.

EU Scientific Committee on Occupational Exposure Limits (SCOEL) (2009) Recommendation from the Scientific Committee on Occupational Exposure Limits for Amitrole. SCOEL/SUM/157.