# Amitrole

| CAS number: | 61-82-5 |
| --- | --- |
| Synonyms: | 3-Amino-1,2,4-triazole, amitrole, aminotriazole |
| Chemical formula: | C2H4N4 |
| Structural formula: |  |

Workplace exposure standard (retained)

| TWA: | **0.2 mg/m3** |
| --- | --- |
| 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/m3 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/m3. 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/m3 | |
|  |
| ACGIH 2001 TLV-TWA: 0.2 mg/m3 |
| 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 oflodine-131 (131 l) 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/m3, 4 h) * NOEL: 0.5 ppm (0.025 mg/kg/d); for 131l 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/m3 |
| MAK value recommended to protect for effects on the thyroid.  No further data. |
| SCOEL 2009 TWA: 0.2 mg/m3 |
| 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/m3; 1 mg/m3 = 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*](http://www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations) 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.