# Tellurium & compounds (as Te)

| CAS number: | 13494‐80‐9 |
| --- | --- |
| Synonyms: | — |
| Chemical formula: | Te |

Workplace exposure standard (retained)

| TWA: | **0.1 mg/m3** |
| --- | --- |
| STEL: | **—** |
| Peak limitation: | **—** |
| Notations: | **—** |
| IDLH: | **25 mg/m3** |
| **Sampling and analysis:** The recommended value is quantifiable through available sampling and analysis techniques. | |

## Recommendation and basis for workplace exposure standard

A TWA of 0.1 mg/m3 for tellurium and its compounds is recommend to protect for central nervous system (CNS) effects and body odour in exposed workers.

## Discussion and conclusions

Elemental tellurium (Te) is used as an additive to copper, iron and steel and in vulcanising rubber. It is also used as a colouring agent in glass and ceramics, in thermoelectric devices and in storage batteries. Certain telluride alloys are employed in the semiconductor industry.

Note this assessment excludes hydrogen telluride and tellurium hexafluoride.

Critical effects of exposure are on the CNS, manifesting as somnolence, anorexia and nausea. Exposure is also associated with the development of an objectionable garlic-like breath (halitosis) and body odour.

No adverse effects were reported in 97% workers of an iron foundry where 62 workers were exposed for 22 months to tellurium fume concentrations between 0.01 and 0.1 mg/m3 with a peak value of 0.74 mg/m3. Two of the 62 workers examined working close to the source of the fume experienced transient nausea. Other symptoms include garlic-like odour of the breath and sweat, dryness of the mouth, metallic taste and somnolence. Acute oral or parenteral intoxication in animals results in restlessness, tremor, diminished reflexes, paralysis, convulsions, somnolence, coma and death (ACGIH, 2018).

Notwithstanding the limited toxicological data, the TWA of 0.1 mg/m3 (as Te) by SWA and ACGIH (2018) is recommend be retained. This TWA will limit the likelihood of developing halitosis and provides a wide margin of protection against potential CNS effects, cyanosis and liver damage.

## 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.

There are insufficient data to recommend a skin notation.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA 1991 TWA: 0.1 mg/m3 | |
|  |
| ACGIH 2001 TLV-TWA: 0.1 mg/m3 |
| The TLV-TWA is recommended for Te and its compounds (excluding hydrogen telluride) and is intended to reduce the likelihood of developing objectionable garlic-like breath odour and to provide a wide margin of protection against potential CNS effects, cyanosis and liver damage.  Summary of data:   * TLV-TWA based on results of examination of workers exposed at 0.01–0.1 mg/m3 fume * Hydrogen telluride excluded because of greater toxicity relative to other compounds.   Human data:   * Ordinary industrial experience with Te not associated with a high degree of toxicity: * no reports of serious illness or death in workers exposed in industry * Physical complaints and findings include somnolence, anorexia, nausea, a metallic taste and garlic-like odour to the breath and perspiration: * garlic-like odour is often the only sign that Te has been absorbed into the body * does not indicate other symptoms or illness are imminent; the odour is socially restrictive * Iron foundry workers exposed for 22 mo (fume) at between 0.01–0.1 mg/m3 with a peak value of 0.74 mg/m3; symptoms reported as garlic-like breath odour and sweat, dryness of the mouth, metallic taste and somnolence: * transient nausea cited by 2/62 workers examined * the 2 workers were likely to be undertaking duties close to the source * no adverse effects on employee health found in 97% of the workers; no further information * Slowly metabolised and eliminated as methyl telluride in urine, sweat and expired air * Te concentrated in the liver, spleen and kidney based on a report of 3 accidental poisonings of sodium tellurite.   Animal data:   * No controlled inhalation studies of either elemental Te, its salts or other derivatives are identified; no bioavailability data available * Acute oral or parenteral intoxication in animals resulted in restlessness, tremor, diminished reflexes, paralysis, convulsions, somnolence, coma and death; no further information.   Insufficient evidence to recommend a skin, sensitisation or carcinogenicity notation or a TLV-STEL. |
| DFG 2006 Not assigned |
| No data suitable for establishing a MAK from studies with humans or animals.  No additional information. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN 2002 TWA: 0.1 mg/m3 |
| Administrative OEL; toxicological database on Te and compounds too poor to justify recommendation of a HBROEL. |

### Secondary source reports relied upon

NIL.

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | Insufficient data |
| --- | --- |
| Is the chemical carcinogenic with a mutagenic mechanism of action? | 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 | — |
| 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 |
| --- |
| Insufficient data to assign a skin notation. |

### IDLH

| Is there a suitable IDLH value available? | Yes |
| --- | --- |

## Additional information

| Molecular weight: | 127.6 u |
| --- | --- |
| 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) (2006) Tellurium and its inorganic compounds – MAK value documentation.

Health Council of the Netherlands (HCOTN) (2002) Tellurium and tellurium compounds. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/055.

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