# Tellurium hexafluoride (as Te)

| CAS number: | 7783-80-4 |
| --- | --- |
| Synonyms: | — |
| Chemical formula: | TeF6 |

Workplace exposure standard (retained)

| TWA: | **0.02 ppm (0.1 mg/m3)** |
| --- | --- |
| STEL: | **—** |
| Peak limitation: | **—** |
| Notations: | **—** |
| IDLH: | **1 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 0.02 ppm (0.1 mg/m3) is recommend to protect for pulmonary irritation in exposed workers.

## Discussion and conclusions

No uses of tellurium hexafluoride have been found. It is a by-product of ore refining.

The critical effect of exposure is respiratory tract irritation as reported in animals and in acute exposures in humans including headache, chest pain, dyspnoea and sleepiness.

In a series of inhalation experiments, rats, rabbits, mice and guinea pigs were exposed at 1 to 100 ppm for one or four hours. Exposures at 5 to 100 ppm for four hours was fatal to all animals with lung oedema being the cause of death. Exposure at 1 ppm for one or four hours induced hyperpnoea and pulmonary oedema but no mortality. Exposure at 5 ppm for one hour caused severe respiratory tract damage and mortality in all mice. While no recognisable adverse effects identified in animals from repeated one‑hour daily exposures at 1 ppm for five consecutive days. It was concluded that a tolerance against acute effects can develop (ACGIH, 2018; HCOTN, 2002). Tellurium hexafluoride is considered approximately 2.5 times as acutely toxic as ozone (TLV–TWA, 0.1 ppm, light work) and on this basis ACGIH recommend a TLV-TWA of 0.02 ppm (0.10 mg/m3).

The toxicological data in humans are very limited. However, based on the evidence in animals and the analogy to ozone, the TWA of 0.02 ppm (0.1 mg/m3)as tellurium is recommended to be retained. This value is consistent across the primary sources.

## 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: 0.02 ppm (0.1 mg/m3) | |
|  |
| ACGIH 2001 TLV-TWA: 0.02 ppm (0.1 mg/m3) |
| TLV-TWA recommended to minimise the potential for respiratory tract irritation reported in animals.  Summary of data:   * TLV-TWA recommended on the basis TeF6 ≈2.5 times as acutely toxic as ozone (TLV‑TWA 0.1 ppm light work) and consistent with the TLV–TWA of 0.1 mg/m3 for Te.   Human data:   * 2 cases of acute poisoning by TeF6: * symptoms included metallic taste, anorexia, lassitude, sleepiness, a rash, bluish-black patches on the skin of the fingers, neck and face, and a sour garlic odour of the breath, sweat and urine; no significant pulmonary effects; no further information * Human exposure reported to cause headache, chest pain and dyspnoea; no further information.   Animal data:   * Reported as a pulmonary irritant in animals * Inhalation toxicity studies using limited numbers of 4 unspecified animal species: * 1 ppm (lowest concentration) for 4 h resulted in pulmonary oedema * 5, 10, 25, 50 and 100 ppm fatal to all animals * a 1 h exposure at 1 ppm produced hyperpnoea and no mortality * repeated 1 h daily exposure at 1 ppm for 5 d resulted in no recognisable adverse effects among the animals * concludes a tolerance against the acute effects * One researcher considered TeF6 as toxic as selenium hexafluoride at one-fifth the concentration and on this basis, was considered ≈2.5 times as acutely toxic as ozone.   Insufficient evidence to recommend skin, sensitisation or carcinogenicity notations or a TLV-STEL. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN 2002 TWA: 0.02 ppm (0.2 mg/m3) |
| Administrative OEL; toxicological database on tellurium and tellurium compounds too poor to justify recommendation of a HBROEL.  Summary of additional data:   * As cited by ACGIH (2018): a series of inhalation experiments in rats, rabbits, mice and guinea pigs exposed at 1–100 ppm for 1 or 4 h. |

### Secondary source reports relied upon

NIL.

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | No |
| --- | --- |
| **The chemical is a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations |
| --- | --- |
| SWA | — |
| HCIS | NA |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | — |
| DFG | NA |
| 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 skin notation. |

### IDLH

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

## Additional information

|  |  |
| --- | --- |
| Molecular weight: | 241.6 |
| Conversion factors at 25°C and 101.3 kPa: | 1 ppm = 9.90 mg/m3; 1 mg/m3 = 0.101 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.

Health Council of the Netherlands (HCOTN) (2002) Tellurium hexafluoride. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/056.

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