# Petaerythritol

| CAS number: | 115-77-5 |
| --- | --- |
| Synonyms: | 2,2-bis(hydroxymethyl)-1,3-propanediol, tetrakis(hydroxymethyl)methane, tetramethylolmethane |
| Chemical formula: | C5H12O4 |
| Structural formula: | — |

Workplace exposure standard (retained)

| TWA: | **10 mg/m3 (inhalable)** |
| --- | --- |
| STEL: | **—** |
| Peak limitation: | **—** |
| Notations: | **—** |
| IDLH: | **—** |
| **Sampling and analysis:** The recommended value is quantifiable through available sampling and analysis techniques. | |

## Recommendation and basis for workplace exposure standard

A TWA of 10 mg/m3 is recommended to protect for possible gastrointestinal tract (GIT) irritation in exposed workers.

## Discussion and conclusions

Pentaerythritol is used primarily in the manufacture of the high explosive pentaerythritol tetranitrate and in the production of pharmaceuticals, insecticides, lubricants and paint-swelling agents.

It is relatively non-toxic. Irritation of the GIT is reported in rats at high doses. It may produce a nuisance effect at high airborne concentrations

Limited data are available in humans. Potential effects on blood glucose in humans reported in a study on metabolism. No changes in body weights, mortality, haematologic parameters and gross and microscopic histopathology reported in rats exposed at 11,000 mg/m3 in an acute inhalation study. No adverse effects in rats, dogs and guinea pigs exposed at 8,000 mg/m3 for 90 days were reported. Severe diarrhoea is reported in rats dosed at 5 g/kg (no further information provided). A NOAEL of greater than 1,000 mg/kg/day is reported in a 28-day gavage study in rats.

Given the limited available data, the current TWA of 10 mg/m3 by SWA is recommended to be retained to protect for gastrointestinal effects in exposed workers as ACGIH (2018) is only other primary source.

## 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: 10 mg/m3 | |
| This value is for inspirable dust containing no asbestos and less than 1% crystalline silica. |
| ACGIH 2013 TLV-TWA: 10 mg/m3 (Inhalable particulate matter) |
| TLV-TWA recommended to minimise the potential for irritation of the gastrointestinal tract seen in rats at high doses.  Summary of data:  Human data:   * Limited data in humans * Potential effects on blood glucose identified in metabolism study.   Animal data:   * LD50: 22.5 g/kg (guinea pigs, oral) * NOAEL of >1,000 mg/kg/d in rats based on biochemical and haematological parameters; 28 d gavage study; controls receive saline; no further information * No changes in body weight, mortality, haematologic parameters and gross and microscopic histopathology in rats exposed at 11,000 mg/m3 in an acute study; no further information * Rats dosed at 5 g/kg demonstrated severe diarrhoea; no further information * Rats, dogs and guinea pigs exposed at 8,000 mg/m3 for 6 h/d 90 d; no adverse effects on body weight, mortality, haematologic parameters and gross and microscopic pathological studies.   Insufficient data to recommend skin, sensitiser or carcinogenicity notation or TLV-STEL. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| 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? | Insufficient data |
| --- | --- |
| Is the chemical carcinogenic with a mutagenic mechanism of action? | Insufficient data |
| **Insufficient data are available to determine if the chemical is a non-threshold based genotoxic carcinogen.** | |

## Notations

| Source | Notations |
| --- | --- |
| SWA | NA |
| HCIS | NA |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | NA |
| DFG | NA |
| SCOEL | NA |
| 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: | 136.15 |
| --- | --- |
| 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.