PETAERYTHRITOL

CAS number: 115-77-5

Synonyms: 2,2-bis(hydroxymethyl)-1,3-propanediol, tetrakis(hydroxymethyl)methane, tetramethylolmethane

Chemical formula: $C_5H_{12}O_4$

Structural formula: —

Workplace exposure standard (retained)

TWA: **10 mg/m^3 (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/m^3 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/m^3 in an acute inhalation study. No adverse effects in rats, dogs and guinea pigs exposed at 8,000 mg/m^3 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/m^3 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/m^3***
This value is for inspirable dust containing no asbestos and less than 1% crystalline silica.		
ACGIH	***2013***	***TLV-TWA: 10 mg/m^3 (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: • LD_{50}: 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/m^3 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/m^3 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/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:	136.15		
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.