

TERPHENYLS

CAS number: 26140-60-3

Synonyms: 1,4-Diphenylbenzene, Santowax® P

Chemical formula: C₁₈H₁₄

Workplace exposure standard (retained)

TWA: —

STEL: —

Peak limitation: 0.5 ppm (4.7 mg/m³)

Notations: —

IDLH: —

Sampling and analysis: The recommended value is quantifiable through available sampling and analysis techniques.

Recommendation and basis for workplace exposure standard

A peak limitation of 0.5 ppm (4.7 mg/m³) is recommended to protect for irritation of the eyes, skin and respiratory tract in exposed workers.

Discussion and conclusions

Terphenyls are primarily used as a heat storage and transfer agent, textile dye carrier, lubricants, sunscreen and in synthesis of partially hydrogenated terphenyls.

Critical effects of exposure are irritation of the eyes, skin and respiratory tract.

Workers in a reactor room exposed to heated coolant vapour at 0.1 to 280 mg/m³ experienced ocular and respiratory tract irritation at concentrations above 10 mg/m³ (ACGIH 2018, HCOTN 2002).

Workers exposed at 0.01 to 0.94 ppm (0.0941 to 8.85 mg/m³) by inhalation experienced no statistically significant symptoms. Workers developed nonspecific, readily reversible skin rashes on chronic exposure (HCOTN 2002).

HCOTN (2002) derived a health-based occupational exposure limit (HBROEL) of 0.5 mg/m³ as an eight-hour TWA based on a NOAEL of 3 mg/kg/day from an oral study in rats. While TLV-Ceiling of 0.5 mg/m³ by ACGIH (2018) is based on the irritation effects observed in workers above 10 mg/m³.

The SWA peak limitation of 0.5 ppm (4.7 mg/m³) is recommended to be retained. This is consistent across primary sources and is cited as being protective of irritation of the eyes, skin and respiratory tract based on evidence in occupational exposure studies.

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.

A skin notation is not recommended based on the available evidence.

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APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	1991	Peak limitation: 0.5 ppm (4.7 mg/m³)
ACGIH	2001	TLV–Ceiling: 0.53 ppm (5 mg/m³)
<p>TLV-TWA recommended to minimise the risk of ocular, dermal and respiratory tract irritation.</p> <p>Summary of data:</p> <p>TLV assigned based on irritation symptoms in workers above 10 mg/m³ (no further justification).</p> <p>Human data:</p> <ul style="list-style-type: none"> Workers in a reactor room exposed to heated coolant vapour (0.1–280 mg/m³) experienced ocular and respiratory tract irritation at exposures >10 mg/m³: <ul style="list-style-type: none"> conclusion based on need to wear dust masks and eye protection at these concentrations (no duration information provided). <p>Animal data:</p> <ul style="list-style-type: none"> LD₅₀: 1,900–10,000 mg/kg (rats, oral) Exposure at 660–3,390 mg/m³ (rats, 1 h or 14 d, Inhalation): <ul style="list-style-type: none"> fatalities at highest concentration respiratory irritation at all concentrations symptoms included acute tracheal necrosis, acute tracheobronchitis, pulmonary oedema, bronchopneumonia, atelectasis, and petechial haemorrhage Exposure at 250 and 500 mg/kg/d (rats, 30 d, oral) symptoms included elevated liver and kidney to body weight ratios, histopathology like the concurrent controls Exposure at 350 mg/kg/d (rats, 188 d, oral) symptoms included loss of body weight, reduced Hb and irreversible, degenerative kidney changes Exposure at 3, 31, 350 mg/kg/d (rats, 235 d, oral): <ul style="list-style-type: none"> NOAEL: 3 mg/kg/d 31 mg/kg/d: unidentified gold yellow granules accumulated in the renal tubular cells 350 mg/kg/d: interstitial nephritis with fibrosis. <p>Insufficient data to recommend a skin, sensitiser or carcinogen notation.</p>		
DFG	NA	NA
No report.		
SCOEL	NA	NA
No report.		
OARS/AIHA	NA	NA
No report.		



Source	Year set	Standard
HCOTN	2002	Ceiling limit: 0.5 ppm (4.5 mg/m³)
The current administrative occupational exposure limit (MAC).		
Summary of additional data:		
<ul style="list-style-type: none">• The committee takes the NOAEL of 3 mg/kg/d from the oral study in rats (cited in ACGIH 2018) as a basis for deriving a health-based recommended occupational exposure limit (HBROEL):<ul style="list-style-type: none">○ factor of 4 for scaling from rat to human based on caloric demand is used○ committee considers an overall UF of 18 appropriate for the extrapolation of a sub-chronic oral NOAEL in rats to a working lifetime-exposed worker○ assuming a 70 kg worker inhales 10 m³ during an 8 h working day, the committee recommends a TWA of 0.5 mg/m³ 8 h• Workers exposed at 0.01–0.94 ppm (inhalation) no symptoms except for (not statistically significant) elevated isocitric dehydrogenase levels:<ul style="list-style-type: none">○ 6/200 workers developed nonspecific, readily reversible skin rashes○ no indications for skin sensitisation (exposure described as chronic, no specific duration provided)• LD₅₀: >12,500 mg/kg (rats, dermal)• Negative results in mutagenicity assays.		

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	—
DFG	NA
SCOEL	NA
HCOTN	—
IARC	NA



Source	Notations
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	
Adverse effects in human case study:	no
Dermal LD ₅₀ ≤ 1000 mg/kg:	no
Dermal repeat-dose NOAEL ≤ 200 mg/kg:	
Dermal LD ₅₀ /Inhalation LD ₅₀ < 10:	
<i>In vivo</i> dermal absorption rate > 10%:	
Estimated dermal exposure at WES > 10%:	
a skin notation is not warranted	

IDLH

Is there a suitable IDLH value available? No

Additional information

Molecular weight:	230.3
Conversion factors at 25°C and 101.3 kPa:	1 ppm = 9.41 mg/m ³ ; 1 mg/m ³ = 0.106 ppm
This chemical is used as a pesticide:	<input type="checkbox"/>
This chemical is a biological product:	<input type="checkbox"/>
This chemical is a by-product of a process:	<input type="checkbox"/>
A biological exposure index has been recommended by these agencies:	<input type="checkbox"/> ACGIH <input type="checkbox"/> DFG <input type="checkbox"/> 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.

Health Council of the Netherlands (HCOTN) (2002) o-, m-, p-Terphenyl (mixture). Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/040.

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