



SUCROSE

CAS number: 57-50-1

Synonyms: Beet sugar, cane sugar, maple sugar, saccharose, sugar

Chemical formula: $C_{12}H_{22}O_{11}$

Structural formula: —

Workplace exposure standard (retained)

TWA: 10 mg/m³

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 dermatoses and dental caries in exposed workers.

Discussion and conclusions

Sucrose is primarily used as a sweetening agent, in fermentation, as a preservative, in the plastics and cellulose industry, and in ink and soaps.

Critical effects of exposure are dermatoses and dental caries.

Sucrose is a substance of low toxicity by all routes of exposure. Occupational observation shows sucrose can produce dermatoses and dental caries. ACGIH (2018) reported an exposure assessment study indicating 5 mg/m³ should protect dental health, provided worker ingestion of the product was also controlled (ACGIH 2018). Various adverse systemic effects were reported in oral animal studies at 5 g/kg body weight and above.

The TWA of 10 mg/m³ is recommended to be retained. The TWA is consistent across primary sources and is cited as being protective of dermatoses and dental caries 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.

There are insufficient data to recommend a skin notation.

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	1991	TWA: 10 mg/m³
ACGIH	2001	TLV-TWA: 10 mg/m³
<p>TLV-TWA recommended to minimise the risk of dermatoses and dental caries in exposed workers.</p> <p>Summary of data:</p> <p>Human data:</p> <ul style="list-style-type: none"> Occupational observation shows sucrose capable of producing dermatoses Uncontrolled concentrations in maternal blood associated with elevated embryonic and foetal death and increased neonatal morbidity and mortality Cause of dental caries in the bakery and confectionery industries, 5 mg/m³ should protect dental health, provided worker ingestion of the product was also controlled (no justification provided). <p>Animal data:</p> <ul style="list-style-type: none"> LD₅₀: 35.4 and 29.7 g/kg (male and female rats, oral): <ul style="list-style-type: none"> clinical signs of toxicity: hypokinesia, prostration, cyanosis, clonic-tonic convulsions, abdominal bloating, and diarrhoea No significant skin irritation when patch tested on intact or abraded rabbit or guinea pig skin In an 18-mo carcinogenic feeding study in rats fed 10% of a standard diet, not carcinogenic, but showed tumour promoting activity: <ul style="list-style-type: none"> similar results observed in a study in rats and mice injected in the neck (3 d/wk, 2 yr) Reviews and reports indicated ingestion of sucrose may cause teratogenic effects: <ul style="list-style-type: none"> skeletal changes in a guinea pig foetus after feeding the mother 5-10 g/kg/d high resorption rate and an increased number of malformed offspring of rats fed a diet of 72% sucrose pregnant ferrets exposed to sucrose (exposure pathway not included) produced litters with significantly reduced body weight, crown-rump length, and head width, length and volume <i>in vitro</i> assays, sucrose was reported not teratogenic Negative results in mutagenicity assays. <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	2004	TWA: 10 mg/m³
The committee considers the toxicological database on sucrose too poor to justify recommendation of a HBROEL. The committee concluded insufficient information to comment on the present MAC (TWA) value.		

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	Carcinogenicity – A4
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

Insufficient data to assign a skin notation.

IDLH

Is there a suitable IDLH value available?



Additional information

Molecular weight:	342.29
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:	<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) (2004) Sucrose. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/140.