# Sucrose

| CAS number: | 57-50-1 |
| --- | --- |
| Synonyms: | Beet sugar, cane sugar, maple sugar, saccharose, sugar |
| Chemical formula: | C12H22O11 |
| 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 |
| TLV-TWA recommended to minimise the risk of dermatoses and dental caries in exposed workers.  Summary of data:  Human data:   * 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).   Animal data:   * LD50: 35.4 and 29.7 g/kg (male and female rats, oral): * 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: * 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: * 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 * *in vitro* assays, sucrose was reported not teratogenic * Negative results in mutagenicity assays.   Insufficient data to recommend a skin, sensitiser or carcinogen notation. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| 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? | Choose an item. |
| --- | --- |

## Additional information

| Molecular weight: | 342.29 |
| --- | --- |
| 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.

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.