



SODIUM METABISULFITE

CAS number: 7681-57-4

Synonyms: Disodium disulphite, sodium pyrosulfate, sodium metabisulphite

Chemical formula: $\text{Na}_2\text{S}_2\text{O}_5$

Structural formula: —

Workplace exposure standard (retained)

TWA: 5 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 5 mg/m³ is recommended to protect for irritation of the upper respiratory tract and mucous membrane in exposed workers.

Given the limited data available from the primary sources, it is recommended that a review of additional sources be conducted at the next scheduled review.

Discussion and conclusions

Sodium metabisulphite is primarily used as a food preservative and as an antioxidant.

Critical effects of exposure are irritation of the upper respiratory tract (URT) and mucous membrane.

Limited data exists from both human and animal studies. ACGIH (2018) extrapolated a 7 mg/m³ NOAEC from a two-year feeding study in rats exposed at 0.215% (intake source not provided). URT and mucous membrane irritation was reported in an inhalation study in dogs exposed at 1 mg/m³ for 290 days (NICNAS 2013).

Given the contradictory exposure data in the two studies, the TWA of 5 mg/m³ by ACGIH is recommended to be retained to limit irritant effects in exposed workers. It is recommended that a review of additional sources be conducted at the next scheduled review.

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 sensitizer or respiratory sensitizer according to the GHS.

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

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	1991	TWA: 5 mg/m³
ACGIH	2001	TLV-TWA: 5 mg/m³
<p>TLV-TWA recommended to minimise the risk of irritation of the URT and mucous membranes in exposed workers.</p> <p>Summary of data:</p> <p>Human data:</p> <ul style="list-style-type: none"> 2 cases of occupational asthma reported in laundry workers (exposure pathway and concentration not noticed) A woman (67 yr of age) reported severe asthma after eating salad with vinegar dressing containing sodium metabisulphite. <p>Animal data:</p> <ul style="list-style-type: none"> LD₅₀: 115 mg/kg (rats, oral); primary response was irritation of the URT Exposure at 0.6% solution (rats, 5–7 wk, oral) was associated with reduced body weight gain caused by thiamine deficiency Exposure at 0.215% (rats, 2 yr, oral) produced no adverse effects (no information provided on intake source): <ul style="list-style-type: none"> extrapolation of data to humans, with a 100-fold UF and assuming equivalent bioavailability, results in an equivalent air concentration of 7.0 mg/m³ Exposure at 0.7, 1.5, 3, 6, and 13 mmol/kg/d (rats, 3 gen, oral): <ul style="list-style-type: none"> reduced body weight gain observed in F1 and F2 generation no effect on birth weights, number of offspring/litter size or other parameters of reproductive success. WHO calculated an ADI for humans of 0.7 mg/kg/d. <p>Not Classifiable as a Human Carcinogen (A4). Insufficient data to recommend a skin or sensitizer notation.</p>		
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

Source	Year	Additional information
NICNAS	✓ 2013	<ul style="list-style-type: none"> LD₅₀: >2,000 mg/kg (rats, dermal) Negative results in skin sensitisation tests on guinea pigs Exposure at 1 mg/m³ aerosol (dogs, 290-d, inhalation) epithelial changes in hyperplastic foci in the respiratory region of the nasal cavity and increase in the conciliated cell numbers in the membranous portion of the trachea Negative results in genotoxic assay.
ECHA	✓ 2011	<ul style="list-style-type: none"> LD₅₀: male 1,420 mg/kg, female 1,630 (rats, oral) LC₅₀: 5,500 mg/m³ (rats, 4 hr) Negative results <i>in vivo</i> and <i>in vitro</i> assays.

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	—
NICNAS	—
EU Annex	NA
ECHA	—
ACGIH	Carcinogenicity – A4
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

Adverse effects in human case study: no
Dermal LD₅₀ ≤ 1000 mg/kg: no
Dermal repeat-dose NOAEL ≤ 200 mg/kg:
Dermal LD₅₀/Inhalation LD₅₀ < 10:
In vivo 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: 190.10

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
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[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.

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (2013) Sulfites: Human health tier II assessment – IMAF report.

European Chemicals Agency (ECHA) (2020) Sodium metabisulphite – REACH assessment.