# Allyl Propyl Disulfide

| CAS number: | 2179-59-1 |
| --- | --- |
| Synonyms: | 3-(Propyldisulfanyl)prop-1-ene, 2-propenyl propyl disulphide, onion oil |
| Chemical formula: | C6H12S2 |
| Structural formula: |  |

Workplace exposure standard (retained)

| TWA: | **2 ppm (12 mg/m3)** |
| --- | --- |
| STEL: | **3 ppm (18 mg/m3)** |
| Peak limitation: | **—** |
| Notations: | **—** |
| IDLH: | **—** |
| Sampling and analysis: | The recommended value is readily quantifiable through currently available sampling and analysis techniques. |

## Recommendation and basis for workplace exposure standard

A TWA of 2 ppm (12 mg/m3) and a STEL of 3 ppm (18 mg/m3)are recommended to protect for irritation of the eyes and upper respiratory tract in exposed workers.

## Discussion and conclusions

Allyl propyl disulfide is used as an additive and flavouring in food manufacturing and is a major component of onion oil. The TWA is recommended based on the irritation of mucous membranes and lacrimation reported in humans at exposures above 3 ppm. This is based on a study that was conducted in the 1940s, with no other human information developed since that time. No animal studies have been reported to support the recommendation of a TWA.

## 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.

Insufficient evidence to recommend a skin notation.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA Year TWA: 2 ppm (12 mg/m3); STEL: 3 ppm (18 mg/m3) | |
|  |
| ACGIH 2014 TLV–TWA: 0.5 ppm (3 mg/m3) |
| TLV–TWA recommended to reduce the risk of the irritation of mucous membranes and lacrimation.  Summary of data:  Human data:   * Study (1946) reported irritation of the eyes, nose, and throat at average of 3.4 ppm * Oral administration of 2.5 mg/kg after 12 h fast to 6 volunteers resulted in significant fall in blood glucose levels and significant rise in serum insulin levels in the subsequent 4 h * Garlic-sensitive patients showed positive skin tests informing the dermal sensitisation notation * No further human data identified.   Animal data:   * No reports from animal studies applicable to TLV-TWA derivation * Sensitisation to garlic water extracts and the related chemical diallyl disulfide demonstrated in guinea pigs, support dermal sensitisation evidence in humans.   Irritating odour associated with disulphides. |
| DFG 1979 MAK: 2 ppm (12 mg/m3) |
| The MAK value has been recommended to protect for irritation effects in workers.  No further data |
| 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? | 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 | Dermal Sensitiser (DSEN) |
| DFG | - |
| 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: | no | -3.00 |  |  | | Dermal LD50/Inhalation LD50 <10: |  |  |  |  | | *In vivo* dermal absorption rate >10%: |  |  |  |  | | Estimated dermal exposure at WES >10%: |  |  |  |  | |  |  | -3 | **a skin notation is not warranted** | | |

### IDLH

| Is there a suitable IDLH value available? | No |
| --- | --- |

## Additional information

| Molecular weight: | 148.28 |
| --- | --- |
| 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.

Deutsche Forschungsgemeinschaft (DFG) (1979) Allylpropyldisulfid – MAK value documentation.