# 2-MetHYLbutyl acetate

| CAS number: | 624-41-9 |
| --- | --- |
| Synonyms: | Methylbutyl acetate: 2-Methyl-1-butanol acetate |
| Chemical formula: | C7H14O2 |
| Structural formula: | — |

Workplace exposure standard (new)

| TWA: | **50 ppm (266 mg/m3)** |
| --- | --- |
| STEL: | **100 ppm (532 mg/m3)** |
| 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 50 ppm (266 mg/m3) is recommended to protect for irritant effects in exposed workers.

A STEL of 100 ppm (532 mg/m3) is recommended to protect for acute irritant effects in exposed workers.

## Discussion and conclusions

2-Methylbutyl acetate is used as a solvent, flavouring agent and in insecticides. Commercial supplies often consist of mixtures of various pentyl acetate isomers.

Irritation is the critical effect of exposure for all pentyl acetate isomers. No information is available regarding 2-methylbutyl acetate as an individual substance. This evaluation is based on information on mixtures of pentyl acetate isomers.

Human volunteers exposed for five minutes reported slight throat discomfort at 100 ppm, severe throat discomfort at 200 ppm and eye irritation at 300 ppm (ACGIH, 2018; DFG, 2000). Mild irritation to the eye, nose, throat and trachea is reported in four volunteers exposed at 185 ppm for five minutes (DFG, 2000). The ACGIH (2018) reports a RD50 of 1,438 and 1,562 ppm in mice which correlates to occupational exposure values of 43 and 47 ppm. A NOAEC of 500 ppm (the highest concentration used in primary amyl acetate study) is identified in a 90-day inhalation study in rats (ECHA, 2019).

A TWA of 50 ppm (266 mg/m3) as assigned by ACGIH (2018) and DFG (2000) is recommended. This TWA is cited to be protective of irritation effects. A STEL of 100 ppm (532 mg/m3) is recommended based on evidence of mild irritant effects in humans exposed for five minutes. It is recommended to consider a pentyl (amyl) acetate isomers grouping 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 sensitiser or respiratory sensitiser according to the GHS.

A skin notation is not recommended based on data in animals.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA NA NA | |
|  |
| ACGIH 2001 TLV-TWA: 50 ppm (266 mg/m3); TLV-STEL: 100 ppm (532 mg/m3) |
| TLV-TWA and TLV-STEL recommended to protect for irritation of the eyes, mucous membranes, throat and nose. Recommended a consolidated grouping of pentyl acetate isomers.  Summary of data:  TLV-TWA and TLV-STEL based on evidence of slight throat discomfort in humans at 100 ppm and RD50 in micecorrelating with suggested occupational exposure values between 43 and 47 ppm; no specific derivation provided.  Human data:   * Irritant effects are considered the same for all pentyl acetate isomers * Eye irritation at 300 ppm, severe throat irritation at 200 ppm, slight throat discomfort at 100 ppm; no further information * Workers exposed between 1 mo–30 yr reported irritation to eyes and photophobia; no further information.   Animal data:   * LD50: 5–16.6 g/kg (rat, single oral dose) mixed isomers * All isomers are irritating to the eyes, skin and respiratory tract * RD50: 1,438–1,562 ppm (mice, no further information); correlate to occupational exposure values of 43 and 47 ppm based on the reported relationship between 0.03 x RD50 and the TLV–TWA for sensory irritants * Narcosis in rats exposed at 5,000 ppm for 30 min by inhalation (mixed isomers).   Insufficient data to recommend carcinogenicity, skin or sensitisation notations for any isomers. |
| DFG 1996/2000 MAK: 50 ppm (260 mg/m3) |
| MAK recommended to protect for irritation effects. Evaluation of grouped pentyl acetate isomers.  Summary of additional data:  No specific derivation of MAK identified; MAK reduced in 1996 from 100 ppm to 50 ppm to prevent severe irritation as evidenced in humans at 200 ppm; supported by animal evidence as cited below.  Data from 2000 publication:   * Eye irritation at 300 ppm, severe throat irritation at 200 ppm, slight throat discomfort at 100 ppm; no further information (cited by ACGIH, 2018) * Mild irritation to the eye, nose, throat and trachea of 4 volunteers exposed at 185 ppm for 5 min; all isomers.   Data from 1996 publication:  Human data:   * Sensitivity to light, conjunctival irritation and lacrimation reported in 30 film industry workers (3,700–14,800 ppm, 4 workers exposed for at least 4–9 yr).   Animal data:   * Irritation threshold estimated at 200–300 ppm * NOAEC of 593 ppm in chronic exposure study (rats, inhalation, mixed isomers, 6 h/d, 11 d) * Developmental NOEC of 500 ppm based on reduced fetal weight: rats, inhalation, isomer mixture, 6 h/d, last 9 d of gestation * Maternal NOEL of 1,500 ppm as measured by incidence of bleeding skin. |
| 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 |
| --- | --- | --- | --- |
| ECHA |  | 2019 | * LD50: >2,000 mg/kg (rats and rabbits, dermal) * NOAEC 500 ppm (primary amyl acetate) in rats: 6 h/d, 5 d/wk, 90-d inhalation; no effects up to highest dose. |

### 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 | NA |
| HCIS | — |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | — |
| ACGIH | — |
| 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 |
| --- |
| |  |  |  |  | | --- | --- | --- | --- | | **Conclusion:** |  |  |  | | Adverse effects in human case study: |  |  |  | | 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: | 130.19 |
| --- | --- |
| Conversion factors at 25°C and 101.3 kPa: | 1 ppm = 5.325 mg/m3; 1 mg/m3 = 0.188 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) (2000) Pentylacetat (alle Isomeren) – MAK value documentation German language edition.

Deutsche Forschungsgemeinschaft (DFG) (1996) Pentyl acetate (all isomers) – MAK value documentation

European Chemicals Agency (ECHA) (2019) 2-Methylbutyl acetate – REACH assessment.