# Hexane, other isomers

| CAS number: | 75-83-2, (2,2-Dimethylbutane)  79-29-8, (2,3-Dimethylbutane)  107-83-5, (2-Methyl pentane)  96-14-0, (3-Methyl pentane) |
| --- | --- |
| Synonyms: | 75-83-2, (Neohexane)  79-29-8, (Diisopropyl)  107-83-5, (Isohexane)  96-14-0, (Diethylmethylmethane) |
| Chemical formula: | C6H14 |
| Structural formula: | — |

Workplace exposure standard (retained)

| TWA: | **500 ppm (1,760 mg/m3)** |
| --- | --- |
| STEL: | **1,000 ppm (3,500 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 500 ppm (1,760 mg/m3) is recommended to protect for eye and mucous membrane irritation and central nervous system (CNS) depression in exposed workers.

A STEL of 1,000 ppm (3,500 mg/m3) is recommended to protect for acute eye and mucous membrane irritation and CNS effects in exposed workers.

## Discussion and conclusions

Hexanes are solvents used in vegetable oils, glues, coatings and paints. They are also found in petroleum fuels.

Critical effects of exposure are irritation of the eyes and mucous membranes, dizziness and CNS depression. Exposure of volunteers at 2,000 ppm for ten minutes caused no reported effect with 5,000 ppm causing dizziness and a sense of giddiness. Slight nausea, headache and eye and throat irritation is reported in humans at 1,400 to 1,500 ppm. Exposure at 1,000 ppm produced signs of CNS depression including dizziness but these effects were not observed at concentrations less than 500 ppm (ACGIH, 2018).

The evidence in humans suggests no effects at 500 ppm and acute, non-severe effects at concentrations greater than 1,400 ppm. As such, it is recommended that the TWA of 500 ppm and STEL of 1,000 ppm be retained.

## 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: 500 ppm (1760 mg/m3); STEL: 1,000 ppm (3,500 mg/m3) | |
|  |
| ACGIH 2001 TLV-TWA: 500 ppm (1760 mg/m3); TLV-STEL: 1,000 ppm (3,500 mg/m3) |
| TLV-TWA recommended to minimise the potential for eye and mucous membrane irritation, dizziness and CNS depression.  Summary of data:  Human data:   * No effects reported following exposure at 2,000 ppm for 10 min: * 5,000 ppm caused dizziness and sense of giddiness; no further information * Slight nausea, headache and eye and throat irritation reported at 1,400–1,500 ppm; no further information * Unacclimated subjects exposed at 500 ppm reported no irritation; no further information * Exposure >1,000 ppm frequent observations of signs of CNS depression, such as dizziness: * not observed at levels <500 ppm * Metabolic process likely different to that of *n*-hexane.   Animal data:   * Narcosis in mice within 30–60 min when exposed at 30,000 ppm * 35,000–40,000 ppm resulted in convulsions and death.   Insufficient data to recommend a skin, sensitiser or carcinogen notation. |
| DFG 1991 MAK: 200 ppm (700 mg/m3) |
| MAK recommended to minimise irritation, CNS effects and potential kidney effects in exposed workers.  Summary of additional data:   * Rats exposed at 1,500 ppm (purified 2‐methylpentane (98%) or 3‐methylpentane (99%) for 9 h/d, 5 d/wk for 15 wk: * no effects observed other than body weight reduction in 2‐methylpentane group * no pathological changes in peripheral nerve tissue on examination 7 and 14 wk later * Rats dosed by gavage at 0.5 mg/kg or 2.0 mg/kg 2‐methylpentane or 2,3‐dimethylbutane, 5 d/wk for 4 wk demonstrated reduced bw: * kidney effects in male rats attributed to sex and species-specific metabolism * MAK consider provisional; no information on its derivation. |
| 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 | — |
| 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 |
| --- |
| Insufficient data to assign a skin notation. |

### IDLH

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

## Additional information

| Molecular weight: | 86.18 |
| --- | --- |
| Conversion factors at 25°C and 101.3 kPa: | 1 ppm = 3.52 mg/m3; 1 mg/m3 = 0.284 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) (1992) Hexane (all isomers except n-hexane) – MAK value documentation.