# Molybdenum, insoluble compounds (as Mo)

| CAS number: | 7439-98-7 |
| --- | --- |
| Synonyms: | — |
| Chemical formula: | Mo |
| Structural formula: | — |

Workplace exposure standard (amended)

| TWA: | **10 mg/m3 (Inhalable); 3 mg/m3 (Respirable)** |
| --- | --- |
| 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 for inhalable sized particulate fraction to protect for irritant effects in exposed workers.

A TWA of 3 mg/m3 is recommended for respirable sized particulate fraction to protect for irritant effects in exposed workers.

## Discussion and conclusions

Metallic molybdenum is used in high temperature and tool steel alloys, in aircraft parts and metal ceramic composite. Molybdenum is an essential element necessary for human health. This evaluation refers to metallic and insoluble molybdenum compounds. There is a separate evaluation for soluble molybdenum compounds.

Metallic and molybdenum compounds such as molybdenum disulfide and molybdenum dioxide are poorly soluble and considered to have low toxicity. There are limited animal experimental data and no human toxicity data. ACGIH (2018) assign the TLV-TWA based on irritant effects for different respirable and inhalable dust fractions.

Given the limited available data, a TWA of 10 mg/m3 is recommended for inhalable sized particulate fractions and a TWA of 3 mg/m3 is recommended for the respirable sized particulate fraction. These TWA are expected to limit irritant effects based on the recommendation by ACGIH (2018).

## 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 2003 TLV-TWA: 10 mg/m3(inhalable); 3 mg/m3 (respirable) |
| TLV-TWA recommended to protect against irritant effects.  Summary of data:   * Essential element necessary for human health * Limited animal experimental data and no human toxicity data * Metallic and molybdenum compounds such as molybdenum disulfide, molybdenum dioxide are poorly soluble and considered to have low toxicity * TLV-TWA based in irritant effects for respirable and inhalable dust fractions. |
| DFG 2000 Not assigned |
| Inadequate data to recommend a MAK for molybdenum compounds apart from molybdenum trioxide (See soluble molybdenum evaluation). |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN 2013 Not assigned |
| No individual health-based OELs can be established for metallic molybdenum and other molybdenum compounds. |

### Secondary source reports relied upon

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| NICNAS |  | ND | * Human health tier I assessment. |

### 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 | — |
| 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: | 96 |
| --- | --- |
| 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) (2002) Molybdenum and its compounds – MAK value documentation.

Health Council of the Netherlands (HCOTN) (2013) Molybdenum and molybdenum compounds. Health-based recommended occupational exposure limit. The Hague: Health Council of the Netherlands; publication no. 2013/30.

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (ND) Molybdenum: Human health tier I assessment– IMAP report.