# Calcium oxide

| CAS number: | 1305-78-8 |
| --- | --- |
| Synonyms: | Lime, quicklime, calcium monoxide, lime, burnt lime, calx |
| Chemical formula: | CaO |
| Structural formula: |  |

Workplace exposure standard (amended)

| TWA: | **1 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 1 mg/m3 is recommended to protect for local irritation effects in the eyes and respiratory tract in exposed workers.

## Discussion and conclusions

The major use of calcium oxide is in mortar, plaster, cement and other building and paving materials.

It is a known irritant to exposed body surfaces including the eyes and respiratory tract (ACGIH, 2018; DFG, 2017; SCOEL, 2008). Irritation effects impact mucous membranes and moist surfaces and appear to reach a plateau after 30 minutes. A NOAEC of 2 mg/m3 is reported in humans for irritation of the eyes, nose and throat in humans following 20 minutes of exposure. In a workplace study, no relevant respiratory symptoms were identified after exposure to 0.4 to 5.8 mg/m3 (ACGIH, 2018; DFG, 2017).

Therefore, a TWA of 1 mg/m3 is considered low enough to reduce the irritation potential in exposed workers.

## 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: 2 mg/m3 | |
|  |
| ACGIH 2001 TWA: 2 mg/m3 |
| TLV-TWA recommended to reduce the potential for irritation of the eye, mucous membrane, nasal and moist skin in exposed workers.  Summary of data:  Human data:   * Very irritating to mucous membranes and moist skin in industrial settings * Effects also include inflammation of the respiratory passages and ulceration and perforation of the nasal septum * Reports of strong nasal irritation following exposure to a mixture of dust containing calcium oxide at ≈25 mg/m3 * no irritation reported at 9–10 mg/m3 * TLV-TWA established based on evidence presented for calcium hydroxide * Insufficient data to recommend skin, sensitiser or carcinogen notations. |
| DFG 2013 MAK: 1 mg/m3 (inhalable fraction) |
| MAK recommended to protect for local irritation effects.  Summary of additional data:   * Slight nasal irritation was observed following exposure of volunteers to concentrations of 2.5 mg/m3 for 30 min * No irritation in eye, nose or throat following exposure of volunteers to 1 or 2 mg/m3 for 20 min * Irritation effects reach a plateau after 30 min * No relevant respiratory symptoms after exposure to 1.2 mg/m3 (0.4–5.8 mg/m3) * No developmental or maternal effects at doses of 680 mg/kg/d in rats and 440 mg/kg/d in mice. |
| SCOEL 2008 TWA: 1 mg/m3 (respirable dust) |
| TWA recommended to prevent sensory irritation.  No additional data. |
| OARS/AIHA NA NA |
| No report |
| HCOTN 2006 TWA: 2 mg/m3 |
| TWA considered an administrative OEL and the HCOTN considers the toxicological data insufficient to justify recommendation of a health based OEL. |

### 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 | NA |
| HCIS | NA |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | — |
| DFG | — |
| SCOEL | — |
| 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: | 56.08 |
| --- | --- |
| 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) (2017) Calcium oxide/oxocalcium – MAK value documentation.

EU Scientific Committee on Occupational Exposure Limits (SCOEL) (2008) Recommendation from the Scientific Committee on Occupational Exposure Limits for Calcium oxide (CaO) and calcium hydroxide (Ca(OH)2. SCOEL/SUM/137.

Health Council of the Netherlands (HCOTN) (2006) Calcium oxide. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2006/08OSH.