



# LITHIUM HYDRIDE

**CAS number:** 7580-67-8

**Synonyms:** Lithium monohydride

**Chemical formula:** LiH

**Structural formula:** —

## Workplace exposure standard (amended)

**TWA:** —

**STEL:** 0.02 mg/m<sup>3</sup>

**Peak limitation:** —

**Notations:** —

**IDLH:** 0.5 mg/m<sup>3</sup>

**Sampling and analysis:** The recommended value is quantifiable through available sampling and analysis techniques.

## Recommendation and basis for workplace exposure standard

A STEL of 0.02 mg/m<sup>3</sup> is recommended to protect for acute irritant effects and damaging caustic effects in exposed workers.

## Discussion and conclusions

Lithium hydride is a chemical synthesis precursor in hydrogen generators. It is used in the manufacture of ceramics and special glass; both as a coolant and in shielding in nuclear reactors, and as a desiccant to dry materials in industrial processes.

Due to its caustic nature, the critical effect of exposure is irritation and damage to the eyes, respiratory tract, nasal mucosa and skin.

Limited toxicological data are available. No irritant effect was identified in workers exposed at 0.025 mg/m<sup>3</sup> with severe nasal and eye irritation and coughing evident at 1.0 mg/m<sup>3</sup> (SCOEL, 2010). An unpublished study in humans reported 0.05 mg/m<sup>3</sup> as being initially objectionable and 0.5 mg/m<sup>3</sup> causing reddening of the exposed skin and lacrimation (DFG, 1990). In a sub-chronic inhalation study, rats, mice, guinea pigs and rabbits exposed at 5 mg/m<sup>3</sup> displayed ulceration of the nose and forepaws. In an acute inhalation study, rats, mice, guinea pigs and rabbits displayed sneezing and coughing when exposed at 4.8 mg/m<sup>3</sup> for four hours (ACGIH, 2018)

A STEL of 0.02 mg/m<sup>3</sup> is recommended based on the evidence of no effect occurring in humans at 0.025 mg/m<sup>3</sup> (SCOEL, 20002). Given that severe eye and nasal irritation is reported in humans at 1.0 mg/m<sup>3</sup> the recommended STEL is protective of severe acute effects associated with extreme short-term concentration excursions.

## **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.

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## APPENDIX

### Primary sources with reports

Source	Year set	Standard
<b>SWA</b>	<b>1991</b>	<b>TWA: 0.025 mg/m<sup>3</sup></b>
<b>ACGIH</b>	<b>2015</b>	<b>TLV-Ceiling: 0.05 mg/m<sup>3</sup></b>
<p>TLV-Ceiling recommended for occupational exposure to high eye and respiratory tract irritating properties.</p> <p>Summary of data:</p> <p>Human data:</p> <ul style="list-style-type: none"> <li>• Case report of worker displaying non-cardiac pulmonary oedema following 3–4 min exposure to lithium hydride fuel mixed with argon; unknown concentrations and proportions; attributed to lithium hydride; full recovery was made</li> <li>• Extremely irritating to mucous membranes and skin; minimal systemic absorption expected due to highly irritant effects and worker would seek removal from exposure</li> <li>• If following dermal contact skin is compromised, higher degree of uptake may occur.</li> </ul> <p>Animal data:</p> <ul style="list-style-type: none"> <li>• Sneeze and cough in rats, mice, guinea pigs, rabbits exposed to 4.8 mg/m<sup>3</sup> for 4–7 h; 10 mg/m<sup>3</sup> caused corrosion of parts of the body fur and the skin on the legs</li> <li>• Rats, mice, guinea pigs and rabbits exposed at 5 mg/m<sup>3</sup> in a set of serial exposures, 4–7 h, total 20 h over 1 wk displayed ulceration of nose and forepaws; toxic effects attributed to strong alkalinity.</li> </ul> <p>Insufficient data to recommend a TLV-TWA, TLV-STEL, skin, sensitiser or carcinogenicity notations.</p>		
<b>DFG</b>	<b>1990</b>	<b>Not assigned</b>
<p>Summary of additional data:</p> <ul style="list-style-type: none"> <li>• Previous 1990 MAK of 0.025 mg/m<sup>3</sup> adopted from 1958 TLV list from USA</li> <li>• Data published to date insufficient to support derivation of MAK; MAK withdrawn</li> <li>• Unpublished report in humans; 0.05 mg/m<sup>3</sup> initially objectionable; 0.5 mg/m<sup>3</sup> causes reddening of the exposed skin and lacrimation; no further information.</li> </ul>		
<b>SCOEL</b>	<b>2010</b>	<b>STEL: 0.02 mg/m<sup>3</sup></b>
<p>STEL recommended to protect for irritation of airways.</p> <p>Summary of additional data:</p> <ul style="list-style-type: none"> <li>• Reported effects; number of workers and duration not provided: <ul style="list-style-type: none"> <li>○ no irritant effect in workers exposed to 0.025 mg/m<sup>3</sup></li> <li>○ severe nasal and eye irritation and coughing at 1.0–5.0 mg/m<sup>3</sup>; skin irritation also reported</li> </ul> </li> <li>• Persons with adaptation complained of eye and nose irritation &gt;0.1 mg/m<sup>3</sup></li> <li>• STEL based on no irritant effects seen at 0.025 mg/m<sup>3</sup>.</li> </ul>		



Source	Year set	Standard
<b>OARS/AIHA</b>	<b>NA</b>	<b>NA</b>
No report.		
<b>HCOTN</b>	<b>NA</b>	<b>NA</b>
No report.		

### Secondary source reports relied upon

Source	Year	Additional information
AIOH	✓ 2018	<ul style="list-style-type: none"> <li>0.02 mg/m<sup>3</sup> STEL recommended, measured as inhalable dust as reaction with moisture will mainly impact the upper airways</li> <li>systemic adverse effects common with therapeutic use are unlikely to occur at OEL.</li> </ul>
NICNAS	* N.D.	<ul style="list-style-type: none"> <li>Tier I Human Health Assessments; no information provided.</li> </ul>
ECHA	✓ 2019	<ul style="list-style-type: none"> <li>Limited data; no further information.</li> </ul>

### 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	—
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? Yes

## Additional information

Molecular weight:	7.95
Conversion factors at 25°C and 101.3 kPa:	1 ppm = Number mg/m <sup>3</sup> ; 1 mg/m <sup>3</sup> = Number ppm
This chemical is used as a pesticide:	<input type="checkbox"/>
This chemical is a biological product:	<input type="checkbox"/>
This chemical is a by-product of a process:	<input type="checkbox"/>
A biological exposure index has been recommended by these agencies:	<input type="checkbox"/> ACGIH <input type="checkbox"/> DFG <input type="checkbox"/> SCOEL

## Workplace exposure standard history

Year	Standard
Click here to enter year	

## References

American Conference of Industrial Hygienists (ACGIH®) (2018) TLVs® and BEIs® with 7<sup>th</sup> Edition Documentation, CD-ROM, Single User Version. Copyright 2018. Reprinted with permission. See the [TLVs® and BEIs® Guidelines section](#) on the ACGIH website.

Australian Institute of Occupational Hygienists (AIOH) Australian Institute of Occupational Hygienists (AIOH) (2018) Position paper Lithium and its hydride and hydroxide compounds – potential for occupational health issues.

Deutsche Forschungsgemeinschaft (DFG) (1992) Lithium hydride – MAK value documentation.

EU Scientific Committee on Occupational Exposure Limits (SCOEL) (2010) Recommendation from the Scientific Committee on Occupational Exposure Limits for lithium hydride. SCOEL/SUM/141.

European Chemicals Agency Regulation (ECHA) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (N.D.) Lithium Hydride (LiH): Human health tier I assessment – IMAF report – site specific.

US National Institute for Occupational Safety and Health (NIOSH) (1994) Immediately dangerous to life or health concentrations – Lithium hydride.