

The MAK Collection for Occupational Health and Safety

Calcium oxide

MAK Value Documentation, addendum – Translation of the German version from 2014

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Keywords: calcium oxide; irritation; maximum workplace concentration; MAK value; peak limitation; developmental toxicity; analogy

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Calcium oxide / oxocalcium

MAK Value Documentation

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Abstract

The German Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area has derived a maximum concentration at the work place (MAK value) for calcium oxide [1305-78-8], considering all toxicity endpoints. The critical effect of calcium oxide is irritation of eyes and upper airways. From studies in volunteers with calcium oxide, a MAK value of 1 mg/m³ for the inhalable fraction is derived. Since local effects are critical, calcium oxide is assigned to Peak Limitation Category I and as there were no irritation effects after 20 minutes exposure to 2 mg/m³, an excursion factor of 2 is set. Studies with calcium oxide show that damage to the embryo or foetus is unlikely when the MAK value is observed and the substance is assigned to Pregnancy Risk Group C. Calcium oxide is neither genotoxic nor carcinogenic. Skin contact is not expected to contribute significantly to systemic toxicity or to lead to sensitization.

Keywords

calcium oxide; oxocalcium; irritation; maximum workplace concentration; MAK value; toxicity; hazardous substance

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Calcium oxide

[1305-78-8]

Supplement 2014

MAK value (2013)	1 mg/m³ I (inhalable fraction)
Peak limitation (2013)	Category I, excursion factor 2
Absorption through the skin	–
Sensitization	–
Carcinogenicity	–
Prenatal toxicity (2013)	Pregnancy Risk Group C
Germ cell mutagenicity	–
BAT value	–

Documentation from 1999 is available for calcium oxide (documentation “Calcium oxide” 1999).

Calcium oxide is a high production volume substance used extensively as a solid, an aqueous solution or a suspension. It is used in about 36 product categories (ECHA 2012) and also as food additive E529 (acid regulator) (Bundesministerium der Justiz 2012).

An 8-hour OEL (occupational exposure limit) of 1 mg/m³ (respirable fraction) with a STEL (short-term exposure limit) of 4 mg/m³ has been established by the Scientific Committee on Occupational Exposure Levels (SCOEL 2008).

All the data relevant for the evaluation of calcium oxide have been described in the documentation for calcium hydroxide (documentation “Calcium hydroxide” 2013), which is formed when calcium oxide comes into contact with water. The most important findings are described briefly below.

After the exposure of volunteers to calcium oxide concentrations of 2.5 mg/m³ for 30 minutes, slight nasal irritation was observed. In a second study with volunteers, exposure to calcium oxide concentrations of 1 or 2 mg/m³ for 20 minutes did not produce any symptoms in the eyes, nose or throat that could be regarded as adverse. The irritative effects reached a plateau after 30 minutes. In a workplace study, no relevant respiratory symptoms were found after exposure to calcium oxide

concentrations of 1.2 mg/m³ (0.4 to 5.8 mg/m³, with personal sampling devices) in the form of inhalable dust. Calcium oxide produced neither maternal nor developmental toxicity up to the highest doses tested of 680 mg/kg body weight and day in rats and 440 mg/kg body weight and day in mice.

Manifesto (MAK value/classification)

The critical effect is local irritation; the systemic effects produced by the calcium ion are negligible (documentation "Calcium hydroxide" 2013). The strongly alkaline hydrolysis product calcium hydroxide is responsible for the locally irritative effects of calcium oxide. The MAK value of 1 mg/m³ I established for calcium hydroxide, its classification in Peak Limitation Category I with an excursion factor of 2 and classification in Pregnancy Risk Group C have therefore been adopted for calcium oxide. In analogy to calcium hydroxide, no other designations have been made.

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