

The MAK Collection for Occupational Health and Safety

Dimethyl sulfoxide

MAK Value Documentation, addendum – Translation of the German version from 2017

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Keywords: dimethyl sulfoxide; developmental toxicity; prerequisite for Pregnancy Risk Group C; skin absorption; MAK value

Citation Note: Hartwig A, MAK Commission. Dimethyl sulfoxide. MAK Value Documentation, addendum – Translation of the German version from 2017. MAK Collect Occup Health Saf [Original edition. Weinheim: Wiley-VCH; 2017 Oct;2(4):1548-1550]. Corrected republication without content-related editing. Düsseldorf: German Medical Science; 2026. https://doi.org/10.34865/mb6768e6217_w

Republished (online): 07 Aug 2026

Originally published by Wiley-VCH Verlag GmbH & Co. KGaA; <https://doi.org/10.1002/3527600418.mb6768e6217>

Addendum completed: 15 Dec 2015

Published (online): 27 Oct 2017

The commission established [rules and measures](#) to avoid conflicts of interest.



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Dimethyl sulfoxide / methylsulfinylmethane

MAK Value Documentation

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DOI: 10.1002/3527600418.mb6768e6217

Abstract

The German Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area has evaluated the possibility to add the indication "Prerequisite for Pregnancy Risk Group C" to the classification of Pregnancy Risk Group B for dimethyl sulfoxide [67-68-5] at the maximum concentration at the workplace (MAK value) of 50 ml/m³. The lowest NOAEL for developmental toxicity in rabbits is 300 mg/kg body weight/day, which after toxicokinetic scaling corresponds to a concentration of 268 ml/m³ at the workplace. Liquid dimethyl sulfoxide penetrates the skin at the same rate as dimethylformamide. In addition to the amount taken up via the lung, it has to be assumed that the same amount of dimethyl sulfoxide is taken up via the skin from the gas phase as was shown with dimethylformamide in volunteers. Therefore, damage to the embryo or foetus is unlikely at the concentration of 12 l/m³ and less. An exposure to this concentration would be the prerequisite for an assignment to Pregnancy Risk Group C.

Keywords

dimethyl sulfoxide; methyl sulfoxide; methylsulfinylmethane; DMSO; sulfinylbismethane; reproductive toxicity; peak limitation; prenatal toxicity; germ cell mutagenicity; absorption through the skin; sensitization; occupational exposure; maximum workplace concentration; MAK value; toxicity; hazardous substance

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Dimethyl sulfoxide

[67-68-5]

Supplement 2017

MAK value (2008)	50 ml/m³ (ppm) $\triangleq$ 160 mg/m³
Peak limitation (2008)	Category I, excursion factor 2
Absorption through the skin (1990)	H
Sensitization	–
Carcinogenicity	–
Prenatal toxicity (2016)	Pregnancy Risk Group B*
Germ cell mutagenicity	–
BAT value	–

*Requirements for Pregnancy Risk Group C

On the basis of the NOAEL (no observed adverse effect level) for developmental toxicity in rabbits of 300 mg/kg body weight and day (which corresponds to a concentration in air of 268 ml/m³; supplement “Dimethyl sulfoxide” 2016), with exclusively inhalation exposure to around 25 ml/m³ toxic effects of dimethyl sulfoxide on prenatal development are unlikely. Dimethyl sulfoxide is, however, also readily absorbed through the skin, and the permeability constant for human skin is in the same range as that for dimethylformamide (Ursin et al. 1995). It was demonstrated by means of whole-body exposure of test persons to dimethylformamide that the same amount absorbed by inhalation can additionally be absorbed via the skin from the gaseous phase (supplement “Dimethylformamide” 2016). In view of the similar permeability constant this can likewise be assumed for dimethyl sulfoxide, so that with exposure to 12 ml/m³ toxic effects of dimethyl sulfoxide on prenatal development are unlikely.

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References

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completed 15.12.2015