

2-Butoxyethyl acetate

MAK Value Documentation, supplement – Translation of the German version from 2020

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Abstract

The German Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area has re-evaluated the carcinogenicity classification of 2-butoxyethyl acetate [112-07-2].

The compound is metabolized to acetic acid and 2-butoxyethanol. The toxic effects of 2-butoxyethyl acetate are similar to those of the better investigated 2-butoxyethanol. There are no carcinogenicity studies of 2-butoxyethyl acetate. 2-Butoxyethyl acetate was classified in Carcinogen Category 4 by analogy with 2-butoxyethanol. As the carcinogenicity classification of 2-butoxyethanol was withdrawn in 2019, the Commission has also removed 2-butoxyethyl acetate from Carcinogen Category 4.

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MAK value (2007)	10 ml/m³ (ppm) $\hat{=}$ 66 mg/m³ ^{a)}
Peak limitation (2007)	Category I, excursion factor 2
Absorption through the skin (1984)	H
Sensitization	–
Carcinogenicity	–
Prenatal toxicity (1986)	Pregnancy Risk Group C
Germ cell mutagenicity	–
BAT value (2015)	150 mg butoxyacetic acid (after hydrolysis)/g creatinine
CAS number	112-07-2
1 ml/m³ (ppm) $\hat{=}$ 6.647 mg/m³	1 mg/m³ $\hat{=}$ 0.150 ml/m³ (ppm)

^{a)} MAK value applies for the sum of the concentrations of 2-butoxyethanol and its acetate in the air

Note: The substance can occur simultaneously as vapour and aerosol.

For 2-butoxyethyl acetate (ethylene glycol monobutyl ether acetate), documentation is available from 1984 (Henschler 1993), and supplements from 2001 (Greim 2001, available in German only) and 2008 (Greim 2008, available in German only).

There are only a few studies available for 2-butoxyethyl acetate. However, since it is metabolized very rapidly to the well-investigated 2-butoxyethanol (ethylene glycol monobutyl ether) and to acetic acid, and the same effects are therefore to be expected for 2-butoxyethyl acetate as for 2-butoxyethanol, in 2007 the MAK value of 10 ml/m³ for 2-butoxyethanol, Peak Limitation Category I with an excursion factor of 2, Pregnancy Risk Group C and Carcinogen Category 4 were adopted also for 2-butoxyethyl acetate. As 2-butoxyethanol was re-evaluated in 2017 with regard to its carcinogenicity, the evaluation of 2-butoxyethyl acetate has also been reviewed.

The following studies of skin and eye irritation and sensitization were not included in the documentation and supplements to 2-butoxyethyl acetate.

In a skin irritation study in rabbits according to the EU Test Guideline (EEC Directive 79/831/EEC), 2-butoxyethyl acetate was evaluated to be non-irritating to the skin (Jacobs et al. 1987, 1989). During semi-occlusive application of 10% 2-butoxyethanol for 3 hours or during the application of undiluted 2-butoxyethanol to the skin of volunteers for 48 hours, the blood flow through the skin was slightly increased, which was regarded as a sign of subclinical irritation. Compared with other substances tested, the skin irritation was minimal and confirmed the result of the rabbit experiment (Jacobs et al. 1989).

2-Butoxyethyl acetate was investigated in the fluorescein leakage test, an in vitro test for cytotoxicity in renal cells, which is used as a substitute for testing eye irritation in vivo. The initial leakage value was 11% and decreased to 2% after 72 hours. Thus, according to the criteria of this test, 2-butoxyethyl acetate would not be classified as an ocular irritant (ECHA 2018). However, this test, which has been accepted as a replacement for an in vivo eye irritation test (as OECD Test Guideline 460), is recommended only for the identification of water-soluble ocular corrosives and severe irritants (OECD 2017).

Both studies confirm the low skin and eye irritation potential of 2-butoxyethyl acetate. After cleavage by esterases in the nasal epithelium, a local irritant effect on the respiratory tract may be possible.

In an unpublished Buehler test in 20 guinea pigs, undiluted 2-butoxyethyl acetate was not sensitizing to the skin. Undiluted 2-butoxyethyl acetate was used for the induction and challenge treatment. No positive reactions occurred 30 and 54 hours after the challenge treatment (ECHA 2018). To date, no studies of skin sensitization are available.

Manifesto (MAK value/classification)

The irritant effect, which is less pronounced than that of 2-butoxyethanol, is assumed to be the most relevant effect in humans.

Carcinogenicity. There are no studies with 2-butoxyethyl acetate itself. 2-Butoxyethyl acetate is metabolized to acetic acid and 2-butoxyethanol. In 2017, 2-butoxyethanol was removed from Carcinogen Category 4 (Hartwig and MAK Commission 2019), since a carcinogenic effect in humans is highly unlikely due to quantitative species differences. Because the assessment of 2-butoxyethyl acetate is based on that of 2-butoxyethanol, 2-butoxyethyl acetate has likewise been removed from Carcinogen Category 4 and is no longer classified as a carcinogen.

Other end points. The results of the new studies have not led to a change in the previous designations: the MAK value of 10 ml/m³, assignment to Peak Limitation Category I with an excursion factor of 2 and classification in Pregnancy Risk Group C have been retained.

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