

The MAK Collection for Occupational Health and Safety

Addendum to 1-Butanol (*n*-Butyl alcohol)

Assessment Values in Biological Material – Translation of the German version from 2016

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Keywords: 1-butanol; 1-butyl alcohol; biological tolerance value; BAT value

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Addendum to 1-Butanol (n-Butyl alcohol) / Butan-1-ol

BAT Value Documentation 2015

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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 BAT values (biological tolerance values) for 1-butanol.

A capillary gas chromatographic head space technique developed by the Working Group "Analyses in Biological Materials" of the German Research Foundation (DFG) was used for determining 1-butanol in urine. For this method hydrolysis is recommended neither for blood nor for urine investigation.

The BAT values of 10 mg 1-butanol/g creatinine (sampling time at the end of exposure or end of shift) and 2 mg 1-butanol/g creatinine (sampling time 16 hours after the end of shift (at the beginning of the next shift)) related to the MAK value of 100 ml/m³ were confirmed.

Keywords

1-butanol; 1-butyl alcohol; butane-1-ol; propyl carbinol; occupational exposure; biological tolerance value; BAT value; toxicity

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BAT (2000)

10 mg 1-butanol/g creatinine

Sampling time: end of exposure or end of shift

2 mg 1-butanol/g creatinine

Sampling time: 16 hours after the end of the shift or at the beginning of the next shift

MAK value (1958)

100 ml/m³ $\triangleq$ 310 mg/m³

Absorption through the skin

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Carcinogenicity

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1 Re-evaluation of the BAT values

In 2000 BAT values for 1-butanol were derived from data on the correlation between external and internal exposure obtained using the MAK value of 100 ml/m³ (Greim 1999, translated) as a basis during annual occupational-medical examinations at industrial workplaces (Lewalter 1998).

The urine samples on which the derivation of the BAT values was based were analysed using the method for the determination of alcohols and ketones developed by the Working Group “Analyses in Biological Materials” (Angerer et al. 1996, translated). This analytical method permits a reliable determination of workplace-related concentrations of alcohols and ketones in blood and urine. The highly volatile alcohols and ketones contained both in blood and in urine are determined using headspace analysis via capillary gas chromatography. The blood and urine samples are heated in airtight crimp top vials to 40 and 50°C, respectively. When the partition equilibrium of the alcohols and ketones between liquid and gas phase is reached a headspace gas phase aliquot is analysed by gas chromatography. This method requires no preceding hydrolysis of the samples (neither for blood nor for urine). The **BAT values** of

10 mg 1-butanol/g creatinine

with a sampling time at the end of exposure or end of shift and

2 mg 1-butanol/g creatinine

with a sampling time 16 hours after the end of the shift or at the beginning of the next shift are confirmed.

2 References

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