

# Tetrachloromethane – Addendum for re-evaluation of the BAT value

## Assessment Values in Biological Material – Translation of the German version from 1999

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**BAT value (1991)<sup>a)</sup>**

**70 µg tetrachloromethane/l blood**

Sampling time: for long-term exposures: at the end of the shift after several previous shifts

**MAK value (1964)<sup>b)</sup>**

**10 ml/m<sup>3</sup> ≅ 65 mg/m<sup>3</sup>**

<sup>a)</sup> No longer valid. For the current value see Bolt (2005).

<sup>b)</sup> No longer valid. For the current value see Greim (2002), Hartwig (2013).

## Re-evaluation of the BAT value in blood and suspension of the BAT value in alveolar air

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Tetrachloromethane (carbon tetrachloride) [56-23-5] is one of the solvents which, due to their high acute and chronic toxicity, are only sporadically used, mostly on a laboratory scale. Accordingly, only few data are available in the literature for biological monitoring of occupational exposure to tetrachloromethane. The setting of the BAT value (biological tolerance value) for alveolar air was essentially based on one experimental study by Stewart et al. (1961). Reference value for the evaluation of the BAT value was the MAK value (maximum workplace concentration) of 10 ml/m<sup>3</sup> (DFG 1964).

The evaluation of the **BAT value in blood** is also based on only very limited data which consist of two Italian field studies and a calculation on the basis of pharmacokinetic data.

From the field study by Brugnone et al. (1983) a concentration of 90 µg tetrachloromethane/l blood was calculated on the basis of a correlation between the concentrations in alveolar air and ambient air and a blood:air partition coefficient determined in vivo under MAK conditions. This value was essentially confirmed by a second field study by Ghittori et al. (1994). From the correlation between external and internal exposure a blood level of about 100 µg tetrachloromethane/l blood was obtained.

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From the pharmacokinetic calculations carried out by Paustenbach et al. (1988), a blood level of 70 µg tetrachloromethane/l whole blood was obtained for an external exposure to 10 ml/m<sup>3</sup>. The toxicological properties of tetrachloromethane require a BAT value on the safe side. The BAT value in blood was therefore established at 70 µg tetrachloromethane per litre whole blood.

A literature search from 1997 back to 1992 provided no indications of new relevant studies which could have been used for a re-evaluation of the BAT value of tetrachloromethane in blood. With reference to the above-named aspects

### **the BAT value of 70 µg tetrachloromethane/l blood**

is therefore still included in the List of MAK and BAT Values.

The determination of tetrachloromethane in alveolar air has not gained significant importance in practical occupational medicine for multiple reasons: An essential factor is that, at present, there are no commercially available sampling systems enabling practice-oriented and reliable sampling for the determination of tetrachloromethane in the exhaled air. Considerable problems can also arise during subsequent analysis. Based on these aspects,

### **no BAT value for tetrachloromethane in alveolar air is established.**

## Notes

### Competing interests

The established rules and measures of the Commission to avoid conflicts of interest ([https://www.dfg.de/en/dfg\\_profile/statutory\\_bodies/senate/health\\_hazards/conflicts\\_interest/index.html](https://www.dfg.de/en/dfg_profile/statutory_bodies/senate/health_hazards/conflicts_interest/index.html)) ensure that the content and conclusions of the publication are strictly science-based.

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