

Trichloroethylene

[79-01-6]

Supplement 2008

MAK value	–
Peak limitation	–
Absorption through the skin (2007)	H
Sensitization	–
Carcinogenicity (1996)	Category 1
Prenatal toxicity	–
Germ cell mutagenicity	–

Absorption through the skin

A comparison of the substance levels in the blood of rats exposed epicutaneously to undiluted solvents for up to 24 hours (3.1 cm² exposed skin) revealed that trichloroethylene is absorbed as efficiently as 1,1,1-trichloroethane, but only half as readily as benzene, tetrachloroethylene, toluene and ethylbenzene. Blood trichloroethylene levels in equilibrium of about 10 mg/ml were reached after 0.5 hours exposure (Morgan et al. 1991).

Only 0.3% of the trichloroethylene absorbed from the gaseous phase was absorbed by volunteers via the skin, the rest via the lungs (Kezic et al. 2000). When volunteers were exposed to liquid trichloroethylene (27 cm² skin) a flux of 430 nmol/cm² and minute was calculated. For an exposed skin surface of 360 cm² and eight repeated three-minute exposures, this corresponds to 3.7 mmol. In comparison, after 8-hour exposure to 50 ml/m³, 3.1 mmol is absorbed (Kezic et al. 2001).

It must therefore be assumed that the absorption of liquid trichloroethylene via the skin contributes considerably to the body burden. As long as no safe limit value for trichloroethylene can be given, trichloroethylene is designated with an “H”.

References

- Kezic S, Monster AC, Krüse J, Verberk MM (2000) Skin absorption of some vaporous solvents in volunteers. *Int Arch Occup Environ Health* 73: 415–422
- Kezic S, Monster AC, van de Gevel IA, Kruse J, Opdam JJ, Verberk MM (2001) Dermal absorption of neat liquid solvents on brief exposures in volunteers. *Am Ind Hyg Assoc J* 62: 12–18
- Morgan DL, Cooper SW, Carlock DL, Sykora JJ, Sutton B, Mattie DR, McDougal JN (1991) Dermal absorption of neat and aqueous volatile organic chemicals in the Fischer 344 rat. *Environ Res* 55: 51–63

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