

2-Methoxypropanol-1

MAK Value Documentation, supplement – Translation of the German version from 2000

MAK Commission^{1,*}

¹ Permanent Senate Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area, Deutsche Forschungsgemeinschaft, Kennedyallee 40, 53175 Bonn, Germany

* email: MAK Commission (arbeitsstoffkommission@dfg.de)

Keywords:

2-methoxypropanol-1, skin absorption

| | |
|---|---|
| MAK value (1988) | 20 ml/m³ (ppm) \pm 75 mg/m³ |
| Peak limitation (1988) | Category II, excursion factor 1 |
| Absorption through the skin (2000) | H |
| Sensitization | – |
| Carcinogenicity | – |
| Prenatal toxicity (1988) | Pregnancy Risk Group B |
| Germ cell mutagenicity | – |
| BAT value | – |
| CAS number | 1589-47-5 |

Citation Note:
MAK Commission.
2-Methoxypropanol-1. MAK Value Documentation, supplement – Translation of the German version from 2000. MAK Collect Occup Health Saf. 2021 Dec:Doc907. DOI: https://doi.org/10.34865/mb158947eoj21_1ad

Manuscript completed:
22 Dec 1999

Publication date:
14 Dec 2021

License: This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).



There are no studies available in either humans or animals of the absorption of 2-methoxypropanol-1 through the skin. However, the data for the internal exposure to this substance obtained in a field study indicate that absorption through the skin contributes to the total exposure of the affected workers (Göen et al. 1993).

In view of the lack of data for the absorption of 2-methoxypropanol-1 through the skin, designation with an “H” (for substances which can be absorbed through the skin in toxicologically relevant amounts) is only possible on the basis of theoretical models. Calculations based on the theoretical model of Fiserova-Bergerova et al. (1990) using the corresponding physical data for 2-methoxypropanol-1 (BUA 1997) (log K_{OW} for the isomer mixture = -0.49; saturation concentration in water = 938 mg/ml) yielded a flux of 1.2945 mg/cm² and hour for the penetration of the liquid through the skin. According to the model of Guy and Potts (1993), a flux of 0.215 mg/cm² and hour is obtained.

The penetration rate is thus similar to that for the toxicologically similar 2-ethoxyethanol (1.2054 mg/cm² and hour according to Fiserova-Bergerova et al. 1990). On the basis of the calculated penetration rates, direct skin contact with liquid 2-methoxypropanol-1 via both hands and forearms (around 2000 cm²) would lead in one hour to the absorption of 2589 mg (according to Fiserova-Bergerova et al. 1990)

or 430 mg (according to Guy and Potts 1993). In comparison, with 8-hour exposure at the MAK value by inhalation only (75 mg 2-methoxypropanol-1/m³, 10 m³ air volume, with absorption of about 60% of the substance), 450 mg 2-methoxypropanol-1 would be absorbed. Percutaneous penetration is thus so high that observation of the MAK value alone is not a sufficient protection. Therefore, 2-methoxypropanol-1 is designated with an “H”.

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) ensure that the content and conclusions of the publication are strictly science-based.

References

- BUA (Beratergremium für Umweltrelevante Altstoffe der Gesellschaft Deutscher Chemiker) (ed) (1997) Propylenglykoldimethylether. BUA-Stoffbericht Nr. 173. Hirzel, Stuttgart
- Fiserova-Bergerova V, Pierce JT, Droz PO (1990) Dermal absorption potential of industrial chemicals: criteria for skin notation. *Am J Ind Med* 17: 617–635. DOI: [10.1002/ajim.4700170507](https://doi.org/10.1002/ajim.4700170507)
- Göen T, Hubner B, Drexler H, Weltle D, Angerer J (1993) Belastungssituation bei der beruflichen Exposition durch 1-Ethoxy-2-propanol und 1-Methoxy-2-propanol – Biological Monitoring. In: Triebig G, Stelzer O (eds) *Verhandlungen der Deutschen Gesellschaft für Arbeitsmedizin und Umweltmedizin, Jahrestagung 1993*. Gentner, Stuttgart, 167–172
- Guy RH, Potts RO (1993) Penetration of industrial chemicals across the skin: a predictive model. *Am J Ind Med* 23: 711–719. DOI: [10.1002/ajim.4700230505](https://doi.org/10.1002/ajim.4700230505)