Recommendation from Scientific Expert Group

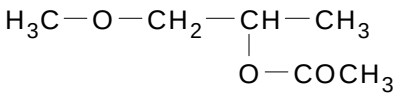
on Occupational Exposure Limits

for 1-Methoxypropyl-2-acetate

8 hour TWA	:	50 ppm (275 mg/m^3)
STEL (15 mins)	:	100 ppm (550 mg/m^3)
Additional classification	:	"skin"

Substance:

1-Methoxypropyl-2-acetate



Synonyms	:	Propyleneglycol-1-mono-methylether-2-acetate; PGMEA 2-Acetoxy-1-methoxypropane	
EINECS N°	:	203-603-9	
EEC N°	:	-	Classification : -
CAS N°	:	108-65-6	
MWt	:	132.16	

Conversion factor (20°C, 101kPa) : 5.50 mg/m^3 = 1 ppm

Occurrence/use:

PGMEA is a liquid with a BPt of 146°C and a vapour pressure of 0.34 kPa at 20°C. It has a vapour density of 5.6 times that of air.

PGMEA is used industrially as a solvent for paints, lacquers, resins, oils and fats. The production rate in the EEC is in excess of 1000 tonnes per annum.

Commercial methoxypropylacetate contains both 1-methoxypropyl-2-acetate (alpha isomer, at least 95%) and 2-methoxypropyl-1-acetate (beta isomer). For the studies mentioned in this summary, the exact composition of the test substance is not known.

Health Significance:

There are no data on the absorption of PGMEA but, by analogy with PGME, it is likely that it will be well-absorbed by inhalation and percutaneously.

The acute toxicity of PGMEA to experimental animals is low. Direct application of the liquid is irritating to the eyes of rabbits; irritation of the skin is described as mild.

The critical effect of PGMEA is irritation of the nasal mucosa. Repeated exposure of mice to 300, 1000 and 3000 ppm (1650, 5500 and 16,500 mg/m^3) PGMEA, 6h/d, 4-5d/w for 2 weeks resulted in a dose-related degeneration of the olfactory epithelium in all exposure groups, accompanied by metaplastic changes and signs of inflammation in the mid- and high- dose groups (Miller *et al*, 1984). Degeneration of the olfactory epithelium was observed in rats only at the high exposure. The authors suggested that these lesions were due to acetic acid resulting from hydrolysis of PGMEA in the nasal epithelium. No signs of systemic toxicity were found in mice. In rats, increased liver weights were noted in the females and kidney changes in the males of the high exposure group.

There are no data concerning the genotoxicity, carcinogenicity or reproductive toxicity of PGMEA. However, as PGMEA is rapidly hydrolysed to PGME, similar negative results might be expected.

There are no human data available.

Recommendation:

The study of Miller *et al* (1984), establishing a LOAEL of 300 ppm (1650 mg/m^3), for irritation of the olfactory epithelium of mice, was considered to be the best available basis for proposing occupational exposure limits. An uncertainty factor of 5 was considered appropriate to allow for the absence of a NOAEL and of human data. Taking into account the preferred value approach, the recommended 8-hour TWA is 50 ppm (275 mg/m^3). A STEL (15 mins) of 100 ppm (550 mg/m^3) was proposed to limit peaks of exposure which could result in irritation. A "skin" notation was recommended as dermal absorption could contribute substantially to the total body burden.

At the levels recommended, no measurement difficulties are foreseen.

Key Bibliography:

Arbete och hälsa 1990: 32. NEG and NIOSH Basis for an Occupational Health Standard: Propylene Glycol Ethers and Their Acetates.

Henschler, D. (ed). Criteria document of occupational exposure limits; 1-Methoxypropylacetate- 2 (26.10.1990). VCH Weinheim.

Miller, R.R., Hermann, E.A., Young, J.T. Calhoun, P.E. and Kastl, P.E. (1984). Propylene glycol monomethyl ether acetate metabolism, disposition and short-term vapour inhalation studies. Toxicol. Appl. Pharmacol. 75, 521-530.