

## Stofdocument deel A

CAS-nr: 75-08-1

**Ethylmercaptaan**

CH<sub>3</sub>CH<sub>2</sub>SH

VN-nr: 2363

GEVI: 33

**Synoniemen:** Ethaanthiol, thioethanol, ethylsulphydraat (Engels: ethyl mercaptan)

Interventiewaarden		10 min.	30 min.	1 uur	2 uur	4 uur	8 uur
Voorlichtingsrichtwaarden	<b>VRW (mg/m<sup>3</sup>)</b>	2,6	2,6	2,6	2,6	2,6	2,6
Alarmeringsgrenswaarden	<b>AGW (mg/m<sup>3</sup>)</b>	560	390	310	240	190	97
Levensbedreigende waarden	<b>LBW (mg/m<sup>3</sup>)</b>	1.700	1.200	920	730	580	290

Datum vaststelling: 24-09-2009 1 mg/m<sup>3</sup> = 0,387 ppm; 1 ppm = 2,58 mg/m<sup>3</sup>

**Explosiegrens:** LEL = 2,8 vol% ≈ 72.000 mg/m<sup>3</sup>

**Geur:** typerende knoflookachtige geur (walgingwekkend), rotte kool

**LOA:** 3,5 x 10<sup>-4</sup> mg/m<sup>3</sup>

### Fysisch-chemische eigenschappen

**Uiterlijk:** kleurloze vloeistof  
**Brand:** zeer brandgevaarlijk

Molecuulmassa: 62,1 g/mol  
Zuurgraad: Geen data  
LogKow: 2,4 (berekend)

**Relatieve dichtheid van verzadigd damp-lucht mengsel:** 1,09

Wateroplosbaarheid: 0,7 g/100 ml (slecht)  
Verzadigde dampdruk: 590 mbar

### Overige informatie

Publieke grenswaarde:  
niet afgeleid  
MAK: 1,3 mg/m<sup>3</sup>  
TLV-TWA: 1,3 mg/m<sup>3</sup>

### Toxicologische eigenschappen

#### Effecten bij inhalatoire blootstelling

Onder VRW: mogelijk lichte oogirritatie en hoofdpijn, misselijkheid

VRW → AGW: oogirritatie, tranenvloed, rode ogen, lichte irritatie van de luchtwegen

AGW → LBW: benauwdheid, longoedeem, ophoesten van bloed, hyperventilatie, hoornvliesbeschadiging, fotofobie, misselijkheid en braken, hoofdpijn, duizeligheid, verwarring/opwinding, pijn op borst, bewustzijnsdaling

Boven LBW: ademstilstand, coma, convulsies, collaps, steffe

#### Toxiciteit bij eenmalige, inhalatoire blootstelling

- Ethylmercaptaan blokkeert de ademhalingsketen in de cel. Hierdoor wordt de energiehuishouding verstoord en kan lactaatacidose ontstaan.
- Primaire doelorganen zijn het centrale zenuwstelsel en het cardiovasculaire systeem.
- Ethylmercaptaan werkt in lage concentraties irriterend op de ogen en luchtwegen.
- De stof kan longoedeem veroorzaken. De verschijnselen hiervan kunnen vertraagd optreden en versterkt worden door lichamelijke inspanning.
- Verlamming van de geurzenuw kan optreden bij hoge concentraties, waardoor de geurwaarneming en het daarmee gepaard gaande waarschuwingssignaal achterwege kan blijven.
- Door de snelle activering van sulfide in het lichaam wordt de toxiciteit van ethylmercaptaan met name bepaald door de concentraties en minder door de blootstellingsduur.

#### Effecten bij blootstelling aan vloeistof

Huidcontact: roodheid, pijn  
Oogcontact: roodheid en pijn

#### Carcinogeniteit

IARC classificatie: niet geassocieerd  
CRP: niet afgeleid

### Beknopte medische informatie

#### Ontsmetting damp

*algemeen:* frisse lucht, rust, 100% zuurstof, halfzittende houding, specifieke behandeling en direct spoedeisende medische hulp inzetten.

#### Ontsmetting vloeistof

*huid:* verontreinigde kleding uittrekken, minimaal 20 min. spoelen met veel water of douchen en arts raadplegen.

*ogen:* minimaal 15 min. spoelen met water (evt. contactlenzen verwijderen), dan naar oogarts brengen, blijven spoelen tijdens vervoer.

*inslikken:* mond laten spoelen (uitspugen!) en arts raadplegen.

**Specifieke behandeling en materialen:** Bij vergiftiging door deze stof is specifieke eerste hulp noodzakelijk; specifieke antidota (o.a. 100% zuurstof) moeten met gebruiksaanwijzing ter plekke beschikbaar zijn.. Voor aanwijzingen over verdere behandeling zo nodig het NVIC (+31(0)30-274 88 88) bellen. .

Neem contact op met het NVIC (tel: +31 (0)30 -274 8888) voor informatie met betrekking tot medisch handelen.

## Stofdocument deel B

CAS-nr: 75-08-1

**Ethyl mercaptan**

CH<sub>3</sub>CH<sub>2</sub>SH

UN-nr: 2363

### Basis for the Dutch Intervention Values

**VRW:** AEGL value is adopted, 2h value added

**AGW:** AEGL value is adopted, 2h value added; time scaling was also applied for the 10 minute AGW value

**LBW:** AEGL value is adopted, 2h value added; time scaling was also applied for the 10 minute LBW value

Date: 24-09-2009

AEGL document: Final, 2013

### Dutch Intervention Values (mg/m<sup>3</sup>)

	10 min	30 min	1 h	2 h	4 h	8 h	End point
<b>VRW</b>	2.6	2.6	2.6	2.6	2.6	2.6	Threshold for respiratory irritation in animals
<b>AGW</b>	560	390	310	240	190	97	1/3 LBW
<b>LBW</b>	1,700	1,200	920	730	580	290	Threshold of lethality in animals

### Derivation of the Dutch Intervention Values

**VRW:** The VRW values are based on a NOAEL for respiratory irritation in rabbits exposed to 10 ppm (26 mg/m<sup>3</sup>) for 20 minutes. At 100 ppm (260 mg/m<sup>3</sup>) and higher the respiratory rate, and respiratory volume decreased and the tidal volume increased. A total uncertainty factor of 10 (3 for interspecies and 3 for intraspecies differences) was applied. The use of higher factors would yield VRW values that are inconsistent with the available human data (0.4 ppm (1.0 mg/m<sup>3</sup>) for 3 hrs/day for 5 or 10 days did not produce mucosal irritation in humans). The VRW values were held constant across time, because mild irritancy generally does not vary greatly over time and because it is not expected that prolonged exposure will result in an enhanced effect.

**AGW:** In the absence of inhalation data, with concentration and duration parameters within the definition of the AGW, the AGW are based on a 3-fold reduction of the LBW values. This is considered a threshold for irreversible effects and is considered appropriate given the steep concentration-response curve (a 4 hour exposure to 2600 ppm (6,700 mg/m<sup>3</sup>) caused 40% lethality in mice, the 4-hr mouse LC<sub>50</sub> was 2,770 ppm (7,200 mg/m<sup>3</sup>), and after a 4 hour exposure to 3,573 ppm (9,200 mg/m<sup>3</sup>) 100% of the mice died; the 4-hr rat LC<sub>01</sub> and LC<sub>50</sub> were 3808 (9,800 mg/m<sup>3</sup>) and 4,740 ppm (12,000 mg/m<sup>3</sup>), respectively. In contrast to the 10 minute AEGL-2 value, time scaling was also applied for the 10 minute AGW value.

**LBW:** The LC<sub>01</sub> of 2,250 ppm (5,800 mg/m<sup>3</sup>) in mice exposed to ethyl mercaptan for 4 hours was used as starting point to derive the LBW values. The mice data, rather than the rat data, were selected for derivation of the LBW-values, because more mice were tested and yielded less uncertainty and a better concentration-response curve. An intraspecies factor of 3 was applied and considered sufficient in view of the steepness of the lethal response curve. The available data indicate that the mouse is the most sensitive species and therefore an interspecies factor 3 is considered sufficient. The similarities in toxicity profile and the robust database of hydrogen sulfide further substantiates the interspecies factor of 3. Time scaling was performed using the equation  $C^n \times t = k$ , with the default values  $n=1$  to extrapolate to longer and  $n=3$  to extrapolate to shorter time points. In contrast to the 10 minute AEGL-3 value, time scaling was also applied for the 10 minute LBW value.

### Additional toxicological information (including relevant results of a general literature search, if any)

Ethylmercaptan, methylmercaptan and hydrogen sulfide have a comparable mechanism of toxicity, but differ in toxic potency in the following order: hydrogen sulfide > methylmercaptan > ethylmercaptan. Hydrogen sulfide and ethyl and methylmercaptan are both irritants and asphyxiants. In humans at relatively low concentrations (<10 ppm; 26 mg/m<sup>3</sup>), minor ocular and respiratory irritation occur, while at higher concentrations (hundreds to thousands of ppm), the central nervous system is affected and paralysis of the respiratory center may lead to rapid death. Liver and kidney damage is also mentioned in literature, but is considered to be secondary to asphyxiation.

No data on developmental and/or reproductive toxicity was located.

H332: Harmful if inhaled.

<b>Carcinogenicity and derivation of the CRP value</b>	<b>Odour and derivation of the LOA value</b>
<p>IARC classification: not classified</p> <p>No carcinogenic risk potency (CRP) was derived.</p> <p>The limited genotoxicity data are equivocal. No chronic or carcinogenicity studies were available.</p>	<p>Odour: typical (nauseating) odour of decaying cabbage</p> <p>OT<sub>50</sub>: <math>8.7 \times 10^{-6}</math> ppm (<math>2.2 \times 10^{-5}</math> mg/m<sup>3</sup>) [AEGL, (2013); Nagata (2003)]</p> <p>LOA = <math>11.8 * OT_{50} * 1.33 = 3.5 \times 10^{-4}</math> mg/m<sup>3</sup></p> <p>(The concentration Level leading to distinct Odour Awareness (I=3) is calculated using the formula: <math>I = 2.33 * \log (C/OT_{50}) + 0.5</math>. A correction factor of 1.33 is applied to this value)</p> <p>The LOA is lower than the VRW values.</p>

<b>Other standards and guidelines (1h values in mg/m<sup>3</sup>, unless otherwise indicated)</b>			
<b>VRW level</b> <b>2.6</b>	<b>AEGL-1</b> 2.5	<b>ERPG-1</b> Not derived	IDLH: 1290 (30 minutes)
<b>AGW level</b> <b>310</b>	<b>AEGL-2</b> 310	<b>ERPG-2</b> Not derived	
<b>LBW level</b> <b>920</b>	<b>AEGL-3</b> 930	<b>ERPG-3</b> Not derived	