Rijksinstituut voor Volksgezondheid en Milieu
Ministerie van Volksgezondheid, Welzijn en Sport

Stofdocument deel A

CAS-nr: 624-92-0

Dimethyldisulfide

CH_3SSCH_3

VN-nr: 2381
GEVI: 336

Synoniemen: DMDS, methyldithiomethaan, 2,3-dithiabutaan (Engels: Dimethyl disulfide)

Interventiewaarden		10 min.	30 min.	1 uur	2 uur	4 uur	8 uur
Voorlichtingsrichtwaarden	**VRW (mg/m^3)**	NA	NA	NA	NA	NA	NA
Alarmeringsgrenswaarden	**AGW (mg/m^3)**	320	220	180	140	110	73
Levensbedreigende waarden	**LBW (mg/m^3)**	790	550	430	350	270	140

Datum vaststelling: 31-10-2017

1 mg/m^3 = 0,255 ppm; 1 ppm = 3,92 mg/m^3

Explosiegrens: 1,1 vol% ≈ 43.000 mg/m^3

Geur: Walgingwekkend, zwavelachtig, knoflookachtig, rotte vis

LOA: 0,0016 mg/m^3

Fysisch-chemische eigenschappen

Uiterlijk: Kleurloze tot lichtgele vloeistof

Brand: Zeer brandgevaarlijk

Relatieve dichtheid van verzadigd damp-lucht mengsel: 1,06

Molecuulmassa: 94,2 g/mol

Zuurgraad: Niet bekend.

LogKow: 1,9

Wateroplosbaarheid: 0,27 g/100 ml (slecht)

Verzadigde dampdruk: 30 mbar

Overige informatie

Publieke grenswaarde: niet afgeleid.

MAK: niet afgeleid.

TLV-TWA: 2.0 mg/m^3

Toxicologische eigenschappen

Effecten bij inhalatoire blootstelling

Onder VRW: geen effecten

VRW → AGW: irritatie van de luchtwegen, keelpijn, hoesten, branderig gevoel, hoofdpijn, misselijkheid, braken, speekselvloed, loopneus

AGW → LBW: lethargie, zwaktegevoel, moeite met ademhalen

Boven LBW: spiertrekkingen, bewustzijnsverlaging, sterfte

Toxiciteit bij eenmalige, inhalatoire blootstelling

- De stof werkt irriterend op de luchtwegen
- De stof kan inwerken op het centrale zenuwstelsel, met als gevolg bewustzijnsverlaging.

Effecten bij blootstelling aan vloeistof

Huidcontact: roodheid, kan in het lichaam worden opgenomen via de huid

Oogcontact: roodheid en pijn, slecht zien.

Carcinogeniteit

IARC classificatie: niet geclassificeerd

CRP: niet afgeleid

Beknopte medische informatie

Ontsmetting damp

algemeen: frisse lucht, rust en direct spoedeisende medische hulp inzetten.

Ontsmetting vloeistof

huid: spoelen met veel water / kleding verwijderen, spoelen en wassen met water en zeep en arts raadplegen.

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

inslikken: mond laten spoelen (uitspugen!), rust, GEEN braken opwekken en arts raadplegen.

Specifieke behandeling en materialen*: geen.*

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

National Institute for Public Health and the Environment
Ministry of Health, Welfare and Sport

Stofdocument deel B

CAS-nr: 624-92-0 **Dimethyl disulfide** CH_3SSCH_3 **UN-nr: 2381**

Basis for the Dutch Intervention Values

VRW: Not recommended, in contrast to ERPG

AGW: Based on information as described in ERPG-document, different values are derived, other time-points added

LBW: Based on information as described in ERPG-document, different values are derived, other time-points added

Date: 31-10-2017 ERPG, 2015

Dutch Intervention Values (mg/m^3)

	10 min	30 min	1 h	2 h	4 h	8 h	End point
VRW	NR	NR	NR	NR	NR	NR	Not recommended
AGW	320	220	180	140	110	73	Absence of clinical effects in rats
LBW	790	550	430	350	270	140	Mortality in rats

Derivation of the Dutch Intervention Values

VRW: No suitable and consistent human or animal data were available to derive a VRW..In absence of appropriate data, VRW-values were set at Not Recommended.

AGW: In the absence of suitable acute exposure studies, the AGW-values were derived from subchronic and subacute inhalation studies in rats. Groups of 20 rats (10 male, 10 female) were exposed via whole-body inhalation exposure to 10, 50, 150 or 250 ppm (39, 196, 588, or 980 mg/m^3) for 6 hours/day, 5 days/week for a period of 13 weeks. No clinical effects were observed up to a concentration of 980 mg/m^3. In another study, rats (4 animals per group) were exposed for 6 hours per day to 100 ppm (392 mg/m^3) for 20 days, or 250 ppm (980 mg/m^3) for 13 days. At 392 mg/m^3 no toxic signs were observed. At 980 mg/m^3 lethargy, respiratory difficulty, and reduced weight gain were observed. However, as these effects were not observed in the subchronic study at 980 mg/m^3, the exposure to 980 mg/m^3 for 6 hours was used as the point of departure for deriving the AGW values. The default uncertainty factor of 10 (3x3) was considered sufficient to account for inter- and intraspecies differences. Time scaling was applied using the default values of n=1 and n=3 when extrapolating to longer and shorter durations, respectively.

LBW: Varying lethality data for dimethyl disulfide are reported in literature with 4-h LC_{50} values ranging from 805 to 1250 ppm (3154 to 4898 mg/m^3) in rats, while repeated exposure to 600 ppm (2351 mg/m^3) for 5 days, 6 hours per day, did not result in any mortality in rats. Furthermore, one study reported an LC_{50} value of 2520 ppm (9874 mg/m^3) in rats after 30 minutes exposure, while in another study rats survived 30 minutes exposure to 3300 ppm (12,931 mg/m^3). Although these results are not always consistent, they illustrate a steep concentration-response relationship for DMDS. One key study in rats was selected for calculation of the LBW values: groups of 5 male and 5 female rats were exposed for 4 hours to concentrations of 500, 700, 775, 800, 840, 875, 950, 1100, and 1581 ppm (1959, 2743, 3037, 3135, 3291, 3429, 3722, 4310, and 6195 mg/m^3), followed by a 14-day observation period. Mortality incidences were 0/10, 0/10, 3/10, 4/10, 5/10, 9/10, 10/10, 10/10, 10/10, respectively. Using Doseresp, the LC_{01} was calculated as 2737 mg/m^3. This point of departure is supported by a study summarized in the REACH dossier, in which 10 rats (5 males and 5 females) were subjected to whole-body inhalation exposure with concentrations of 847, 1188, 1308, or 1650 ppm (3319, 4655, 5125, or 6465 mg/m^3) for 4 hours, followed by a 14-day observation period. Mortality incidences for all concentrations were 0/10, 4/10, 4/10 and 9/10, respectively. Using Doseresp, the LC_{01} for that study was calculated as 3319 mg/m^3. The LC_{01} of 2737 mg/m^3 was used as PoD for the LBW. The default uncertainty factor of 10 (3x3) was considered sufficient to account for inter- and intraspecies differences. Time scaling was applied using the default values of n=1 and n=3 when extrapolating to longer and shorter durations, respectively.

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

DMDS is used as an insecticide. In insects, the mechanism of action is dysfunction of the mitochondria. The mechanism of action in mammals is not known, however, steep dose-response curves were demonstrated in mice and rats.

Inhalation developmental and reproductive toxicity studies in rats and rabbits indicated that DMDS is not reprotoxic.

A study in the REACH dossier was used to support the point of departure for the LBW values. In this study, the acute inhalation toxicity of DMDS was evaluated in a 4-hour, single-exposure study in rats (5 animals per sex per dose). Rats were exposed through whole-body vapor exposure at concentrations of 847, 1188, 1308, or 1650 ppm (3319, 4655, 5125, or 6465 mg/m^3) for 4 hours, followed by a 14-day observation period and clinical observations immediately following each exposure and at 1, 2, 4, 6 and 8 hours post-exposure. Mortality incidences for all concentrations were 0/10, 4/10, 4/10 and 9/10, respectively.

No harmonised H-sentences for human health.

Carcinogenicity and derivation of the CRP value
IARC classification: not classified. No carcinogenic risk potency (CRP) was derived.

Odour and derivation of the LOA value
Odour: Repellent, pungent garlic, decaying fish OT_{50}: 0.0001 mg/m^3 [Ruth, 1986] LOA = 11.8 * OT_{50} * 1.33 = 0.0016 mg/m^3 (The concentration Level leading to distinct Odour Awareness (I=3) is calculated using the formula: I = 2.33 * log (C/OT_{50}) + 0.5. A correction factor of 1.33 is applied to this value) The LOA lies below VRW-level.

***Other standards and guidelines** (1h values in mg/m^3, unless otherwise indicated)* [a]

VRW level	*AEGL-1*	*ERPG-1*		*IDLH:* not derived.
NR	-	0.04		
AGW level	*AEGL-2*	*ERPG-2*		
180	-	193		
LBW level	*AEGL-3*	*ERPG-3*		
430	-	963		

[a] Note that the ERPG values as presented here (in mg/m^3) are derived using the conversion factors of the ERPG.