

Stofdocument deel A

CAS-nr: 78-79-5

Isopreen

$\text{CH}_2=\text{C}(\text{CH}_3)-\text{CH}=\text{CH}_2$

VN-nr: 1218

GEVI: 339

Synoniemen 2-methyl-1,3-butadien (Engels: isoprene)

Interventiewaarden		10 min.	30 min.	1 uur	2 uur	4 uur	8 uur
Voorlichtingsrichtwaarden	VRW (mg/m³)	53	53	53	53	53	53
Alarmeringsgrenswaarden	AGW (mg/m³)	5600*	3900*	3100*	2400	1900	1300
Levensbedreigende waarden	LBW (mg/m³)	11000*	7400*	5900*	4700*	3700*	1900
Datum vaststelling: 31-10-2017		1 mg/m ³ = 0,353 ppm; 1 ppm = 2,83 mg/m ³					
Explosiegrens: 1,0 vol% \approx 28.000 mg/m ³ * berekende interventiewaarde hoger dan 10% LEL			Geur: penetrant, scherp LOA: 2,14 mg/m ³				
Fysisch-chemische eigenschappen				Overige informatie			
Uiterlijk: kleurloze zeer vluchtige vloeistof Brand: zeer brandgevaarlijk		Molecuulmassa: 68,1 g/mol Zuurgraad: - LogKow: 2,4		Publieke grenswaarde: niet afgeleid MAK: 8,5 mg/m ³ TLV-TWA: niet afgeleid			
Relatieve dichtheid van verzadigd damp-lucht mengsel: 1,8		Wateroplosbaarheid: 0,064 g/100 ml (zeer slecht) Verzadigde dampdruk: ca 600 mbar					
Toxicologische eigenschappen							
Effecten bij inhalatoire blootstelling <u>Onder VRW:</u> hoesten <u>VRW → AGW:</u> irritatie ogen, huid en luchtwegen, keelpijn, hoesten <u>AGW → LBW:</u> sufheid, bewustzijnsdaling <u>Boven LBW:</u> coma, sterfte				Toxiciteit bij eenmalige, inhalatoire blootstelling <ul style="list-style-type: none"> Isopreen werkt irriterend op de ogen, luchtwegen en de huid. De stof veroorzaakt effecten op het CZS, met als gevolg bewustzijnsdaling. 			
Effecten bij blootstelling aan vloeistof <u>Huidcontact:</u> roodheid <u>Oogcontact:</u> roodheid en pijn				Carcinogeniteit IARC classificatie: groep 2B CRP: niet afgeleid			
Beknopte medische informatie							
Ontsmetting damp <i>algemeen:</i> frisse lucht, rust en arts raadplegen.							
Ontsmetting vloeistof <i>huid:</i> verontreinigde kleding uittrekken, spoelen en wassen met water en zeep. <i>ogen:</i> minimaal 15 min. spoelen met water (evt. contactlenzen verwijderen), dan naar oogarts brengen. <i>inslikken:</i> mond laten spoelen (uitspugen!), GEEN braken opwekken en onmiddellijk 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							

Stofdocument deel B

CAS-nr: 78-79-5

Isoprene

$\text{CH}_2=\text{C}(\text{CH}_3)\text{-CH}=\text{CH}_2$

UN-nr: 1218

Basis for the Dutch Intervention Values

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

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 2006

Dutch Intervention Values (mg/m^3)

	10 min	30 min	1 h	2 h	4 h	8 h	End point
VRW	53	53	53	53	53	53	Irritation of upper respiratory tract in humans
AGW	5600*	3900*	3100*	2400	1900	1300	Slight lung congestion in rats
LBW	11000*	7400*	5900*	4700*	3700*	1900	Lethality in rats

* value higher than 10% of LEL

Derivation of the Dutch Intervention Values

VRW: VRW levels were based on results of a human volunteer study in which 10 subjects were exposed to isoprene using 6 concentrations ranging from 5 to 160 mg/m^3 . Information on the exposure duration or the individual exposure concentrations was not clear. Slight irritation of the mucosa of the nose, larynx or pharynx was perceived at 160 mg/m^3 . An exposure of 160 mg/m^3 was selected as point of departure for the VRW-levels. As the observed effects were minimal, no additional factor was applied to derive a no-effect-level. The default uncertainty factor of 3 was considered sufficient to account for intraspecies differences. Time scaling was not applied as respiratory irritation is considered to be concentration-dependent rather than concentration x time-dependent.

AGW: AGW levels were based on results of a subacute rat inhalation study with isoprene. Two male and two female rats exposed to isoprene for 6 hours/day for 15 days at 1670 ppm (4726 mg/m^3) had no toxic signs and the necropsy was normal, while another group of two male and two female rats exposed for 6 hours/day for 6 days at 6000 ppm (16980 mg/m^3) had lungs that were slightly congested. It is noted that the description of the results of this study were very limited. Results of a second subacute inhalation study (well-described) showed no (pulmonary) effects at 7000 ppm (19810 mg/m^3) upon exposure of 6h/d, 5d/week for two weeks. In the absence of suitable single exposure experiments, the data of these two subacute studies were used for derivation of the AGW. The exposure of 6 hours to 16980 mg/m^3 was selected as point of departure for deriving AGW levels. The default uncertainty factor of 10 (3x3) was considered sufficient to account for inter- and intraspecies differences. Time scaling was performed using the equation $C^n \times t = k$ with the default $n = 1$ and $n = 3$, to extrapolate to longer and shorter durations, respectively.

LBW: LBW values were based on results from an acute rat lethality study. The reported LC_{16} , LC_{50} and LC_{84} -values for rats after 4 hours exposure were 92,000, 180,000 and 381,000 mg/m^3 . Because this study reported only these LC_{16} , LC_{50} , and the LC_{84} values obtained by probit analysis and not the individual experimental data, benchmark dose-response modeling is not possible. However, the LC_{01} can be calculated because the mean is known and the standard deviation of the underlying lognormal distribution can be derived from these data. A 4-hour LC_{01} of 37183 mg/m^3 for rats was calculated. In the same study LC_{16} , LC_{50} and LC_{84} -values were established for 2-hour exposure to mice as well. These values were 117,000, 157,000, 212,000 mg/m^3 , respectively, leading to a calculated 2-hour LC_{01} of 78914 mg/m^3 for mice. This value is supportive to the 4-hour LC_{01} of 37183 mg/m^3 for rats. The rat LC_{01} value was chosen as point of departure for derivation of LBW values, as it resulted in the lowest LBW-values. The default uncertainty factor of 10 (3x3) was considered sufficient to account for inter- and intraspecies differences. Time scaling was performed

using the equation $C^n \times t = k$ with the default $n = 1$ and $n = 3$, to extrapolate to longer and shorter durations, respectively.

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

Isoprene causes irritation of the eyes and respiratory tract. The substance may cause effects on the central nervous system, resulting in lower consciousness.

In a mouse developmental toxicity study, a concentration-related increase in the percentage of fetuses per litter with supernumerary ribs was noted at all dose levels, in presence of maternal toxicity (reduced bw). No such effects were observed in a rat developmental toxicity study.

H341: Suspected of causing genetic defects, H350: May cause cancer

Carcinogenicity and derivation of the CRP value

IARC classification: group 2B (possibly carcinogenic to humans)

No carcinogenic risk potency (CRP) was derived.

Odour and derivation of the LOA value

Odour: pungent

Odour threshold: 0.136 mg/m³ [Nagata 2003]

LOA = 11.8 * OT * 1.33 = 2.14 mg/m³

(The concentration level leading to distinct odour awareness (I=3) is calculated using the formula: $I = 2.33 * \log(C/OT) + 0.5$. A correction factor of 1.33 is applied to this value)

The LOA is below the VRW

Other standards and guidelines (1h values in mg/m³, unless otherwise indicated) ^a

VRW level 53	AEGL-1 -	ERPG-1 14	IDLH: -
AGW level 3100	AEGL-2 -	ERPG-2 2790	
LBW level 5900	AEGL-3 -	ERPG-3 11160	

^a Note that the ERPG values as presented here (in mg/m³) are derived using the conversion factors of the ERPG.