

Stofdocument deel A

CAS-nr: 7664-38-2

Fosforzuur

H₃PO₄

VN-nr: 3453 (100%); 1805 (85% in water)

GEVI: 80

Synoniemen: orthofosforzuur (Engels: phosphoric acid)

Interventiewaarden		10 min.	30 min.	1 uur	2 uur	4 uur	8 uur
Voorlichtingsrichtwaarden	VRW (mg/m³)	1,0	1,0	1,0	1,0	1,0	1,0
Alarmeringsgrenswaarden	AGW (mg/m³)	64	44	35	18	8,8	4,4
Levensbedreigende waarden	LBW (mg/m³)	300	210	160	82	41	20
Datum vaststelling: 31-10-2017		1 mg/m ³ = 0,245 ppm; 1 ppm = 4,076 mg/m ³					
Explosiegrens: niet afgeleid			Geur: geurloos				
			LOA: niet afgeleid				
Fysisch-chemische eigenschappen				Overige informatie			
Uiterlijk: heldere kleurloze hygroscopische kristallen of viskeuze vloeistof Brand: niet brandbaar		Molecuulmassa: 98,0 g/mol Zuurgraad: pH 1,2 (bij 85 g/100 ml) LogKow: Geen data		Publieke grenswaarde: 1 mg/m ³ MAK: 2 mg/m ³ TLV-TWA: 1 mg/m ³			
Relatieve dichtheid van verzadigd damp-lucht mengsel: 1,0		Wateroplosbaarheid: 548 g /100 ml (volledig) Verzadigde dampdruk: 2 mbar					
Toxicologische eigenschappen							
Effecten bij inhalatoire blootstelling <u>Onder VRW:</u> keelpijn en hoest <u>VRW → AGW:</u> branderig gevoel achter het borstbeen <u>AGW → LBW:</u> kortademigheid <u>Boven LBW:</u> ademnood, larynx- en glottisoedeem				Toxiciteit bij eenmalige, inhalatoire blootstelling <ul style="list-style-type: none"> Blootstelling aan fosforzuur kan ernstige chemische brandwonden, longoedeem en chemische pneumonitis veroorzaken. De verschijnselen hiervan kunnen vertraagd optreden en versterkt worden door lichamelijke inspanning. De stof is bijtend en kan bijtende effecten op de slijmvliezen van ogen en/of hogere luchtwegen veroorzaken. In ernstige gevallen kans op verstikking door zwelling in de keel. 			
Effecten bij blootstelling aan vloeistof <u>Huidcontact:</u> roodheid en pijn, blaren, ernstige brandwonden <u>Oogcontact:</u> roodheid en pijn, slecht zien, hoornvliesbeschadiging, ernstige brandwonden.				Carcinogeniteit IARC classificatie: niet geclassificeerd. Fosforzuur in sterke anorganische mist wordt beschouwd als carcinogeen (groep 1)(IARC monograph Volume 54, 1992) CRP: niet afgeleid			
Beknopte medische informatie							
Ontsmetting damp <i>algemeen:</i> frisse lucht, rust, halfzittende houding, direct spoedeisende medische hulp inzetten Ontsmetting vloeistof <i>huid:</i> overmaat stof droog verwijderen, verontreinigde kleding uittrekken, minimaal 20 min. spoelen met veel water of douchen, zo nodig arts raadplegen. <i>ogen:</i> minimaal 15 min. spoelen met water (evt. contactlenzen verwijderen), dan naar oogarts brengen, blijven spoelen tijdens vervoer. <i>inslikken:</i> mond laten spoelen (uitspugen!), GEEN braken opwekken, direct spoedeisende medische hulp inzetten. 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: 7664-38-2

Phosphoric acid H_3PO_4

UN-nr: 3453/1805

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,2011

Dutch Intervention Values (mg/m^3)

	10 min	30 min	1 h	2 h	4 h	8 h	End point
VRW	1.0	1.0	1.0	1.0	1.0	1.0	Weight of evidence threshold for irritation in un-acclimatised humans.
AGW	64	44	35	18	8.8	4.4	Threshold for irritation in animals
LBW	300	210	160	82	41	20	Threshold for lethality in rats.

Derivation of the Dutch Intervention Values

In the absence of toxicity data with phosphoric acid, data are derived from studies with smoke of white or red phosphorous (P_4)_n. One mole of red or white phosphorous can produce 4 moles of phosphoric acid. The values are calculated back to phosphoric acid equivalents using a factor of 3.16 (MW conversion factor).

VRW: Anecdotal data in humans indicate that concentrations ranging from 5.0 to 15.6 mg phosphoric acid equivalents/ m^3 caused coughing among un-acclimatised people. Concentrations of 100 mg/ m^3 phosphorus pentoxide (138 mg phosphoric acid equivalents/ m^3) were unbearable, except to acclimatised workers. "Momentary" exposure of hydroaerosols of phosphoric acid (1.6, 7.2, and 11.0 mg phosphoric acid equivalents/ m^3) produced irritation in 12 out of 15 healthy adults at the highest concentration, in 3 out of 15 in the middle concentration and no irritation was reported at the lowest concentration. A third study indicates that phosphoric acid mist concentration of 1.0 mg/ m^3 is irritating to the un-acclimatised worker. There is no single study that can serve as PoD for derivation of the VRW. However, based on a weight of evidence approach and the circumstantial data in humans, a VRW of 1.0 mg/ m^3 is proposed. Time scaling was not applied because mild irritant effects generally do not vary greatly over time.

AGW: In the absence of suitable human data, the AGW is based on animal data. Acute inhalation toxicity studies show that 380 mg/ m^3 phosphorus pentoxide (or 525 mg phosphoric acid equivalents/ m^3) for 60 minutes causes unmistakable signs of irritation, pulmonary congestion, haemorrhages, and respiratory distress in rats. In mice, 110 mg/ m^3 phosphorus pentoxide (or 152 mg phosphoric acid equivalents/ m^3) for 60 minutes also causes unmistakable signs of irritation, congestion and difficulty in breathing. Concentrations of 450 mg/ m^3 red phosphorus (1422 mg phosphoric acid equivalents/ m^3) in the rat and rabbit and 111 mg/ m^3 red phosphorus (351 mg phosphoric acid equivalents/ m^3) in the mouse for one hour did not produce respiratory tract damage after a 14-day observation period. The concentration of 351 mg phosphoric acid equivalents/ m^3 (1 hr) was used as PoD for the AGW. The default uncertainty factor of 10 (3x3) was considered sufficient to account for inter- and intraspecies differences. Time scaling was applied using the equation $C_n \times t = k$ with the default values of $n=1$ and $n=3$ when extrapolating to longer and shorter time points, respectively. The resulting AGW-values are supported by human data: human workplace studies show that 138 mg/ m^3 phosphoric acid equivalent was unbearable to un-acclimatised workers.

LBW: Several acute inhalation lethality studies are available with red phosphorous smoke in different laboratory animals and are summarised in the ERPG document. Datasets of two of the five rat lethality studies were considered most relevant. In one of the two rat studies, rats were exposed to unformulated pure red phosphorus for 1 hour whole-body in a 10 m^3 chamber at 1422, 2749, 5056 and 6731 mg/ m^3 (as phosphoric acid equivalents). Mortality was 0/12, 2/10, 6/9, and 12/12, respectively. In the second study rats were exposed to red phosphorous for one hour at

concentrations of 6420, 4410, 4030 and 2727 mg phosphoric acid equivalents/m³ or 4 hours to 1210 mg phosphoric acid equivalents/m³. Mortality rates were 9/10, 7/10, 3/10, 2/10 and 2/10. The mortality data were used to calculate two 1-hour LC₀₁ values of 1754 mg/m³ and 1637 mg/m³ of phosphoric acid, respectively, and the lowest value was used as PoD. The default uncertainty factor of 10 (3x3) was considered sufficient to account for inter- and intraspecies differences. Time scaling was applied using the equation $C^n \times t = k$ with the default values of n=1 and n=3 when extrapolating to longer and shorter time points, respectively.

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

Phosphoric acid is a corrosive mineral acid that causes irritation and inflammation to the respiratory tract after inhalation and induces cellular toxicity most likely due to its activity as a reducing agent resulting in disruption of oxidative processes.

Phosphoric acid is not reproductive toxic or developmental toxic in animals.

H314: Causes severe burns and eye damage.

Carcinogenicity and derivation of the CRP value

IARC classification: not classified

Strong-inorganic-acid mists containing phosphoric acid are carcinogenic to humans (group 1) (IARC monograph 54, 1992).

No carcinogenic risk potency (CRP) was derived

Odour and derivation of the LOA value

Odour: odourless

No LOA was derived due to lack of data.

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

VRW level 1.0	AEGL-1^b 12	ERPG-1 3	IDLH: 1000 (30 min)
AGW level 35	AEGL-2 35	ERPG-2 30	
LBW level 160	AEGL-3 150	ERPG-3 150	

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

^b Values are proposed AEGL values for red phosphorous and calculated to phosphoric acid equivalents