Section A1 Applicant

Annex Point IIA1

1.1 Applicant

This dossier is submitted on behalf of a consortium of co-operating companies (joint submission). The activities are co-ordinated by the Peracetic Acid Registration Group (PAR), a sector group of Cefic. The co-operating companies, being the actual applicants, are mentioned below.

All comments and queries about the submitted dossier should be addressed to:

Peracetic Acid Registration Group (PAR)

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PAR has the following member companies:

[redacted]

Section A1 Applicant

Annex Point IIA1

Section A1 Applicant

Annex Point IIA1

1.2 Manufacturer of Active Substance (if different)

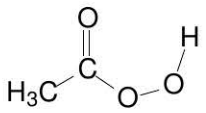
[redacted]

1.3 Manufacturer of Product(s) (if different)

[redacted]

Section A2 Identity of Active Substance

Annex Point IIA, II.2.1-2.9

Subsection (Annex Point)			Official use only
2.1	**Common name (IIA2.1)**	Peracetic acid	
2.2	**Chemical name (IIA2.2)**	Peroxyethanoic acid	
2.3	**Manufacturer's development code number(s) (IIA2.3)**	None assigned	
2.4	**CAS No and EC numbers (IIA2.4)**		
2.4.1	**CAS-No**	79-21-0	
	Isomer	There are no isomers.	
2.4.2	**EC-No**	201-186-8	
	Isomer	There are no isomers.	
2.4.3	**Other**	Not available	
2.5	**Molecular and structural formula, molecular mass (IIA2.5)**		
2.5.1	**Molecular formula**	$C_2H_4O_3$	
2.5.2	**Structural formula**		
2.5.3	**Molecular mass**	76.05 g/mol	
2.6	**Method of manufacture of the active substance (IIA2.1)**	[redacted]	X1

Section A2	Identity of Active Substance	
Annex Point IIA, II.2.1-2.9		
	[redacted]	X2
2.7 **Specification of the purity of the active substance, as appropriate (IIA2.7)**	[redacted]	X3
2.8 **Identity of impurities and additives, as appropriate (IIA2.8)**	[redacted]	X4
2.9 **The origin of the natural active substance or the precursor(s) of the active substance**	[redacted]	

Section A2	Identity of Active Substance	
Annex Point IIA, II.2.1-2.9 (IIA2.9)		

Evaluation by Competent Authorities

EVALUATION BY RAPPORTEUR MEMBER STATE

Date [redacted]

Materials [redacted]

methods

Conclusion [redacted]

Reliability n.a.

Acceptability acceptable

Remarks	[redacted]
List of appendices	[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]

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[redacted]

[redacted]

[redacted]

[redacted]

Section A2.10	Exposure data in conformity with Annex VIIA to Council Directive 92/32/EEC (OJ No L, 05.06.1992, p. 1) amending Council Directive 67/548/EEC
Annex Point IIA2.10	

Subsection		Official use only
2.10.1 Human exposure towards active substance		
2.10.1.1 Production		
i) Description of process	Equilibrium PAA, i.e. solutions of peracetic acid, hydrogen peroxide, acetic acid and water are produced by reacting glacial acetic acid with hydrogen peroxide in the presence of a catalyst such as a mineral acid: $CH_3COOH + H_2O_2 \rightleftharpoons CH_3CO(O_2)H + H_2O$ Specific grades are obtained by controlling the concentration and amount of hydrogen peroxide and acetic acid during the manufacturing process. Adding an acid or increasing the temperature during the manufacturing process can accelerate the establishment of the final equilibrium concentration.	
ii) Workplace description	In the following, a non-confidential version of the description of the production process as presented in the confidential part of the dossier is provided. For this reason, the explanation is less detailed and no photographs as in the confidential part are attached. The following description refers to a state of the art production facility, where the formation of equilibrium takes place in the final packaging. Another way of production, where equilibrium PAA is filled, is possible but requires more attention to avoid inhalation hazards. Though the PAR members are likely to follow production standards of comparable level, no information is available to judge whether the description provided is representative for all PAR members. It is the understanding of the applicant that the safety of particular production facilities is under the scope of national regulations in the first place. It is not, however, a primary scope of the BPD. Workers in described production plant wear goggles, chemical resistant coveralls (washed by professionals) and gloves where appropriate. The raw materials hydrogen peroxide [redacted] and acetic acid [redacted] are stored in suitable storage tanks, while de-ionised water is stored in standard containers. The storage containers for additives are stored in a separate room. The components are pumped into mixing tanks via fixed and closed installations. No connecting and/or disconnecting of equipment is involved. The production process is controlled electronically. Only trained personnel is involved. The production process is started by pumping water into the mixing tank; then acetic acid is added and finally hydrogen peroxide and the additives. The mixture is continuously stirred in the mixing tank. From the	

Section A2.10 Annex Point IIA2.10	Exposure data in conformity with Annex VIIA to Council Directive 92/32/EEC (OJ No L, 05.06.1992, p. 1) amending Council Directive 67/548/EEC
	mixing tank, the mixture is pumped through pipes of a closed system to the fully automated filling installation. None of the steps of the filling process (transport of containers to the filling lance, filling of containers, closing of containers, stacking on pallets) is done by hand. It should be noted that the mixture which is filled into the containers does not yet contain PAA. Only during the storage of the containers, PAA is formed from acetic acid and hydrogen peroxide. A time period of up to 3 weeks is needed for the establishment of a final equilibrium between the components.
iii) Inhalation exposure	Inhalation exposure to the active substance peracetic acid is practically impossible, as the rate of the peracetic acid forming reaction is very low, i.e. noteworthy amounts of peracetic acid are only formed during storage of the reaction mixture in closed containers. Inhalation exposure to the precursors hydrogen peroxide, acetic acid and the reaction mixture is negligible, as nearly the whole production process is run as a closed system.
iv) Dermal exposure	Dermal exposure to the active substance peracetic acid is practically impossible, as the reaction rate of peracetic acid forming reaction is very low, i.e. noteworthy amounts of peracetic acid are only formed during storage of the reaction mixture in closed containers. Dermal exposure to the precursors hydrogen peroxide, acetic acid and the reaction mixture is avoided, as nearly the whole "production" process is run as a closed system.
2.10.1.2 Intended use(s)	Please refer to Doc. IIB, chapter 8 of the respective dossiers on equilibrium and in-situ products, providing detailed descriptions of the intended biocidal uses and the related human health and environmental exposure.
1. Professional Users	
i) Description of application process	ditto
ii) Workplace description	ditto
iii) Inhalation exposure	ditto
iv) Dermal exposure	ditto
2. Non-professional users including the general public	The only use for non-professional users is the household use of in-situ products for laundry disinfection. Please refer to Doc. IIB, chapter 8 of the respective in-situ product.
(i) via inhalational contact	ditto
(ii) via skin contact	ditto
(iii) via drinking water	ditto
(iv) via food	ditto
(v) indirect via environment	ditto

Section A2.10	Exposure data in conformity with Annex VIIA to Council Directive 92/32/EEC (OJ No L, 05.06.1992, p. 1) amending Council Directive 67/548/EEC
Annex Point IIA2.10	

2.10.2 Environmental exposure towards active substance

2.10.2.1 Production

(i) Releases into water	Owing to the peculiarities of the production process (see 2.10.1.1), releases of PAA into water are very limited. Any waste water is collected and reconditioned in a neutralising facility. In the unlikely event of high concentrations of PAA and peroxides in the waste water, the water would be treated with sodium bisulphite, which destroys peroxides under the formation of sulphates. The plant is approved according to national and local regulations.
(ii) Releases into air	Releases of PAA into air are nearly impossible, because significant amounts of peracetic acid are only formed during storage of the reaction mixture in closed containers. Releases into air of the precursors hydrogen peroxide, acetic acid and the reaction mixture are negligible as nearly the whole "production" process is run in closed system.
(iii) Waste disposal	No PAA containing waste is produced.

2.10.2.2 Intended use(s)

Please refer to Doc. IIB, chapter 8 of the respective dossiers on equilibrium and in-situ products, providing detailed descriptions of the intended biocidal uses and the related human health and environmental exposure.

Affected compartment(s):	The partitioning of peracetic acid in the environment was estimated by a fugacity level III calculation according to McKay using EPIWIN v.320: The output of EPIWIN can be found in Document IV (A.7.3.1/01).
water	96.9% mass amount
sediment	0.00001% mass amount
air	2.99% mass amount
soil	0.132% mass amount
Predicted concentration in the affected compartment(s) water	Please refer to Doc IIB, chapter 8.3
sediment	
air	
soil	

Section A2.10	**Exposure data in conformity with Annex VIIA to Council Directive 92/32/EEC (OJ No L, 05.06.1992, p. 1) amending Council Directive 67/548/EEC**
Annex Point IIA2.10	

	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	*2012*
Materials and methods	*Applicant's version is adopted.*
Conclusion	*Applicant's version is adopted,see Document IIB*
Reliability	*Not applicable.*
Acceptability	*Acceptable.*
Remarks	-
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Results and discussion	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Sample table:

Table A2.10-: Workplace exposure

Exposure scenario	Workplace operation	PPE	Year(s) of measure-ment	Number of measurements	Type of measurements	Exposure concentration	Reference
Atmospheric monitoring during filling of IBC containers with PAA	*Air samples were taken at approx. 2 feet distance from the top of 1000 kg IBC containers during filling of a 15% PAA product (3 reading) and of a 5% product (1 reading). Two background readings were taken approx 20 yards from the fill point when no filling took place.*	*Not relevant*	*1996*	*6*	*Not specified*	*PAA concentrations were < 0.15 ppm close to the top of the containers during filling. The background levels were between 0.1 and 0.15 ppm.*	*Doc. No. 574-004; A.2.10/01*

Exposure scenario	Workplace operation	PPE	Year(s) of measure-ment	Number of measurements	Type of measurements	Exposure concentration	Reference
Atmospheric monitoring of PAA	*In a pharmaceutical company, bottles were disinfected by rinsing with peracetic acid solution. During rinsing, atmospheric measurements were performed.*	*Not relevant*	*1990*	*3, one at sampling points I, II and III each.*	*The air in the room was sucked through a bottle containing 100 ml distilled water. PAA was determined by titration.* *Sampling times were 20, 20 and 30 min at sampling points I, II and III, respectively*	*Sampling point 1 (about 1.5 m in front of bottle line no. 1): < 0.1 mg PAA /m^3* *Sampling point 2 (directly above bottle line no. 1): 0.51 mg PAA/m^3* *Sampling point 3 (about 1 m behind bottle line no. 1): 0.2 mgPAA/m^3* *Mean PAA concentration: 0.26 mg/ m^3*	*Doc. No. 574-001; A.2.10/04*
Atmospheric monitoring of peroxygen concentration in a preparation room of a hospital. Not explicitly stated that PAA was measured since total oxidant was expresses as hydrogen peroxide in mg/m^3	*In a hospital the atmospheric concentration of peroxygen was measured about 10 cm and 40 cm above liquid levels of a disinfection bath (Nu-Cidex bath) in a confined space when the lid of the bath was off and on. Purpose of the bath not stated but very likely for the disinfection of medical equipment.*	*Not relevant*	*1995*	*Not stated.*	*The air in the room at two distances above a disinfection bath measured. Sampling times at each location were 10 min per test.*	*About 40 cm above bath, lid off: 0.46 mg peroxygen/m^3* *About 10 cm above bath, lid off: 0.46 mg peroxygen/m^3* *About 40 cm above bath, lid on:< 0.15mg peroxygen/m^3*	*Doc. No. 574-003; A.2.10/06*
Atmoshperic monitoring of peroxygen concentration in a preparation room of a hospital. Not explicitly stated that PAA was measured.	*In a hospital the atmospheric concentration of peroxygen was measured about 3 cm and 10 cm above liquid levels of a disinfection bath (Nu-Cidex bath) in a confined space when the lid of the bath was*	*Not relevant*	*1995*	*Not stated.*	*The air in the room at two distances above a disinfection bath measured. Sampling times at each location were 10 min per test.*	*About 3 cm above bath, lid off: 1.00 ppm peroxygen* *About 10 cm above bath, lid off: 0.15 ppm*	*Doc. No. 574-005; A.2.10/07*

Exposure scenario	Workplace operation	PPE	Year(s) of measure-ment	Number of measurements	Type of measurements	Exposure concentration	Reference
	off and on. Purpose of the bath devised for the disinfection of medical equipment (endoscopes)					*peroxygen* *About 3 cm above bath, lid on: 0.05 ppm peroxygen* *About 10 cm above bath, lid on: 0.05 ppm peroxygen*	
[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]

Exposure scenario	Workplace operation	PPE	Year(s) of measure-ment	Number of measurements	Type of measurements	Exposure concentration	Reference
Atmospheric monitoring of peroxygens at different time points and locations following fogging of an animal house with PAA (4 % "Peratol") when the doors were closed. Total hydrogen peroxide was measured.	*Exposure toward total peroxygen (expressed as ppm hydrogen peroxide) during fogging in a closed shed to simulate worst-case conditions likely to be encountered by contracted operatives. Exposure measurements served also to prove the efficiency of fogging in closed shed and to correlated exposure levels with symptoms of irritancy in the operators.*	*No stated.*	*1986*	*Not stated.*	*Measurement of air concentrations in a closed shed at different locations in the shed and at different time point after fogging.*	*2 ppm H_2O_2 5 -10 min after fogging* *1 – 1.5 ppm H_2O_2 15 - 25 min after fogging* *0.5 – 1 ppm H_2O_2 25 - 35 min after fogging* *< 0.5 ppm H_2O_2 40 - 45 min after fogging* *not detectable from 50 min onwards*	*Doc. No. 575-001; A.2.10/09*
Measurement of inhalation and dermal exposure towards different active substances used in four industries performing dipping activities.	*The exposure measurements were performed by HSE in industries where a substantial amount of dipping with biocides takes place. These were:* - *timber preservation (fencing manufacture, timber window frame manufacture, prefabricated timber building manufacture, bespoke joinery).* - *leather tanning (tannery and fellmongering)* - *mariculture (net antifouling)* - *textile treatments (padding,*	*Gloves, coverall and boots, depending on operations and scenario.*		*Timber industry: fencing manufacture (2 sites, 2 data points), timber window frame manufacture (1 site, 1 data point), prefabricated timber building manufacture (one site, 1 data point), bespoke joinery (one site, 1 data point).* *Leather industry: tannery (one site, 2 data points) and fellmongering (two*	*Atmospheric and personal measurement performed on workers following application of wood preservatives, surface biocides, antifouling products and public-hygiene insecticides.*	*For an overview of the results of exposures measured during the site visits please refer to TNsG on human exposure, part II, dipping models 1 - 4*	*Doc. No. 575-002; A.2.10/10*

Exposure scenario	Workplace operation	PPE	Year(s) of measure-ment	Number of measurements	Type of measurements	Exposure concentration	Reference
	wool scouring) *Objective of the study was also to obtain information on operator tasks and assess potential for and routes of exposure. Work activities in these four industries covered:*			*sites, 3 data points).* *Mariculture: net antifouling (4 sites, 9 data points)* *Textiles: padding (3 sites, 4 data points), wool scouring (one site, 2 data points)*			

Exposure scenario	Workplace operation	PPE	Year(s) of measure-ment	Number of measurements	Type of measurements	Exposure concentration	Reference
The potential inhalation exposure following spraying of surfaces in a dairy and a slaughterhouse was measured. Two different products containing 1.2 % and about 5 % PAA, respectively, were used.	*Spraying of surfaces in a dairy and slaughterhouse*	*Respiratory protection, coverall, gloves*	*2006*		*Air concentrations a slaughterhouse and in a dairy. Measurements were performed for a period of 15 minutes.*	*Dairy (5 % PAA formulation, 0.5 % application/in-use concentration):* *< 0.41 mg/m³ PAA (operator)* *1.32 mg/m³ PAA (hall)* *Slaughterhouse (1.2 % PAA formulation; 0.025 % application/in-use concentration):* *0.80 mg/m³ PAA (operator)* *0.65 mg/m³ PAA (slaughterhouse)* *Slaughterhouse (5 % PAA formulation; 0.05 % application/in-use concentration):* *0.50 mg/m³ PAA (operator)*	*Doc. No. 575-005; A.2.10/12*

Exposure scenario	Workplace operation	PPE	Year(s) of measure-ment	Number of measurements	Type of measurements	Exposure concentration	Reference
						5.74 mg/m^3 PAA (slaughterhouse; invalid measurement as measuring probe was directly sprayed)	

Changes by the RMS are highlighted in bold font.

Peracetic acid (PAA) is produced commercially either as equilibrium solutions, in which peracetic acid is in equilibrium with hydrogen peroxide (H_2O_2), acetic acid and water or as distilled product containing primarily PAA and water. For more information on the different types of peracetic acid, please refer to section 2. **For biocidal uses, mainly equilibrium PAA is used**.

Equilibrium PAA solutions are manufactured by reacting acetic acid with hydrogen peroxide. For this reason, the pure substance is not produced/isolated when these aqueous solutions are manufactured. Pure (100 %) peracetic acid does not exist commercially, and any attempt to produce it would be prevented by the explosion risks of such a compound.
Owing to these facts, this chapter is mainly based on data on two representative equilibrium PAA solutions (recently performed studies) and on literature data, which also addresses those physical-chemical parameters which are meaningful for the pure substance PAA.

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
3.1 Melting point, boiling point, relative density (IIA3.1)								
3.1.1 Melting point								
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Anonymous, 2001, Doc. No. 092-003; A3.1.1/01	
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Anonymous, 2001, Doc. No. 092-003; A3.1.1/01	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	**Method**	**Purity/ Specification**	**Results**	**Remarks/ Justification**	**GLP (Y/N)**	**Reliability**	**Reference**	**Official use only**
	92/69 EEC, Part A, methods for the determination of physico-chemical properties, A.1 "Melting temperature"	[redacted]	-73°C	The melting temperature was determined by differential scanning calorimetry.	Y	1	Mekelburger (2007), Doc. 112-003; A3.1.1/02	
3.1.2 Boiling point								
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Mücke & Sprössig (1969), Doc. No. 192-002; A3.1.2/01	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	**Method**	**Purity/ Specification**	**Results**	**Remarks/ Justification**	**GLP (Y/N)**	**Reliability**	**Reference**	**Official use only**
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Swern (1970), Doc. No. 192-003; A3.1.2/02	
	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	Anonymous, 2001, Doc. No. 092-003; A3.1.1/01	
	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	Anonymous, 2001, Doc. No. 092-003; A3.1.1/01	
	92/69 EEC, Part A, methods for the determination of physico-chemical properties, A.2 "Boiling temperature"	[redacted]	105°C	The boiling temperature was determined by differential scanning calorimetry.	Y	1	Mekelburger (2007), Doc. 112-003; A3.1.1/02	
3.1.3 Bulk density/ relative density								

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
	EEC Directive 92/69 A 3 and OECD guideline 109 Oscillating densitimeter	[redacted]	D^{20}_4 = 1.1535	Density of a representative PAA product.	Y	1	Mekelburger (2007), Doc. No. 213-002; B3.6/02	
	EEC Directive 92/69 A 3 and OECD guideline 109 Oscillating densitometer	[redacted]	D^{20}_4 = 1.1284	Density of a representative PAA product.	Y	1	Mekelburger (2007), Doc. No. 213-001; B3.6/01	
3.2 Vapour pressure (IIA3.2)								
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Swern (1970), Doc. No. 192-003; A3.1.2/02	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
	OECD guideline 104 and EU test method A.4 (92/69/EEC)	[redacted]	$p_{(20°C)}$ = 17 hPa	Dynamic method The total vapour pressure of the test item is provided, not the partial pressure of peracetic acid.	Y	1	Mekelburger (2007), Doc. No. 115-003, A3.2/01	
3.2.1 Henry´s Law Constant (Pt. I-A3.2)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Lind & Kok, (1986), Doc. No 192-005; A3.2.1/01	
3.3 Appearance (IIA3.3)								
3.3.1 Physical state 3.3.2 Colour 3.3.3 Odour	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	MSDSs See Doc I, Appendix 8_safety data sheets_formulations	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
3.3.1 Physical state 3.3.2 Colour 3.3.3 Odour	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Swern (1970), Doc. No. 192-003; A3.1.2./02	
3.4 Absorption spectra (IIA3.4)								
UV/VIS	OECD guideline 101	[redacted]	The UV-VIS spectra at pH <2, 7 and >12 showed no absorption maxima.	--	Y	1	Doc. No. 217-003; A3.4/01	
IR	FT-IR spectrometer, spectral resolution 2 cm^{-1}, spectral range 4000 to 400 cm^{-1}, 32 scans; sample was prepared as a film between windows of sodium chloride.	[redacted]	The IR spectrum taken is in accordance with the proposed structures of the components of the test item.	--	Y	1	Doc. No. 217-002; A3.4/02	
NMR	NMR-spectrometer, frequency 500 MHz, spectral range -4 to 16 ppm, 32 scans, solvent d_6-DMSO, internal standard TMS	[redacted]	The ^{1}H-NMR spectrum is in accordance with the proposed structures of the components of the test item.	--	Y	1	Doc. No. 217-001; A3.4/03	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
MS	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	--	
3.5 Solubility in water (IIA3.5)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Swern (1970), Doc. No. 192-003; A3.1.2/02	
3.6 Dissociation constant (-)	QSAR calculation (ACD/LogD Suite Program, Version 9, Adanced Chemistry Development, Toronto, Canada	Not applicable: calculation	pKa = 8.08		n.a.	2	Brachhold (2007), Doc. No. 154-001; A3.9/03	
	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	Swern (1970), Doc. No. 192-003; A3.1.2/02	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
	OECD guideline 112	[redacted]	pKa = 8.24	Though the study was performed with a [redacted] product, the result refers to the PAA molecule.	Y	1	Mekelburger (2007), Doc. No. 115-002, A3.6/01	
3.7 Solubility in organic solvents, including the effect of temperature on solubility (IIIA3.1)	CIPAC MT 181	[redacted]	**Solubility at 25 °C:** n-Heptane: < 10 g/l p-Xylene: < 10 g/l 1,2-Dichloroethane: < 10 g/l Propan-2-ol: > 500 g/l Acetone: > 500 g/l Ethyl acetate: 20-25 g/l	Tests on the effect of temperature on the solubility of PAA in organic solvents should not be performed for the following reasons: • It is predictable that the solubility in organic solvents will increase with increasing temperature. • PAA should not be mixed with organic solvents for safety reasons: especially at elevated temperatures, mixing with organic solvents will pose a risk of explosion.	Y	1	Doc. No. 215-007; A3.7/01	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
3.8 Stability in organic solvents used in b.p. and identity of relevant breakdown products (IIIA3.2)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	--	
3.9 Partition coefficient n-octanol/water (IIA3.6)	EPA "Shake Flask" method		25°C log K_{ow} = - 0.46 at pH 5, - 0.60 at pH 7 and – 0.66 at pH 9.		--	2	Byers (1998), Doc. No. 114-002; A3.9/01	
	Calculation		logK_{ow} = -1.25 ± 0.05 at 25°C			2	Thus (1994), Doc. No. 114-001; A3.9/02	
	QSAR calculation (ACD/LogD Suite Program, Version 9, Adanced Chemistry Development, Toronto, Canada	Not applicable: calculation	logP_{ow} = -0.23 at pH 5, -0.26 at pH 7 and -1.2 at pH 9			2	Brachhold (2007), Doc. No. 154-001; A3.9/03	
3.10 Thermal stability, identity of relevant breakdown products (IIA3.7)								

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	**Method**	**Purity/ Specification**	**Results**	**Remarks/ Justification**	**GLP (Y/N)**	**Reliability**	**Reference**	**Official use only**
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Swern (1970), Doc. No. 192-003; A3.1.2/02	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	**Method**	**Purity/ Specification**	**Results**	**Remarks/ Justification**	**GLP (Y/N)**	**Reliability**	**Reference**	**Official use only**
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	F. Fichter, W. Lindenmaier (1929), Doc No. 192-008; A3.10/02	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	**Method**	**Purity/ Specification**	**Results**	**Remarks/ Justification**	**GLP (Y/N)**	**Reliability**	**Reference**	**Official use only**
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	W.H. Hatcher, F. J. Toole (1926), Doc. No. 192-009; A3.10/03	
			[redacted]		[redacted]	[redacted]	Anonymous, 2001, Doc. No. 092-003; A3.1.1/01 MSDSs See Doc I, Appendix 8	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
	Adiabatic calorimeter under nitrogen atmosphere	[redacted]	Tests on thermostability (adiabatic calorimeter under nitrogen atmosphere) performed with two products revealed decomposition temperatures (temperatures at which decomposition starts) of 33°C and 42°C, respectively, and SADT values (Self Accelerating Decomposition Temperature) of >50°C for both products. It is important to mention that these investigations were not performed according to any standardized test methodology.		N	2	Schrieber, M, 2000, doc. No. 241-005, A3.10/01 Post-submitted July 2009	
3.11 Flammability, including auto-flammability and identity of combustion products (IIA3.8)								
	EEC Directive 92/69 A 15	[redacted]	Auto-ignition temperature: 280 °C	--	Y	1	Mekelburger (2007), Doc. No. 242-005, B3.4/02	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
	EEC Directive 92/69 A 15	[redacted]	Auto-ignition temperature: 435 °C		Y	1	Mekelburger (2007), Doc. No. 242-004, B3.4/01	
3.12 Flash-point (IIA3.9)								

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	**Method**	**Purity/ Specification**	**Results**	**Remarks/ Justification**	**GLP (Y/N)**	**Reliability**	**Reference**	**Official use only**
	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	Anonymous, 2001, Doc. No. 092-003; A3.1.1/01 SDS (combined)	
3.13 Surface tension (IIA3.10)								

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
	EEC Directive 92/69 A 5 and OECD guideline 115	[redacted]	47.7 mN/m at 20 °C (ring method) for the neat solution		Y	1	Mekelburger (2007), Doc. No. 216-003; B3.10/02	
	EEC Directive 92/69 A 5 and OECD guideline 115	[redacted]	54.0 mN/m at 20 °C (ring method) for the neat solution	The surface tension was determined with the ring method.	Y	1	Mekelburger (2007), Doc. No. 216-002, B3.10/01	
3.14 Viscosity (-)								
	OECD guideline 114	[redacted]	Kinematic viscosity: 1.50 $mm^2 s^{-1}$ at 20 °C The determination of the kinematic viscosity was carried out by the capillary method with a viscosimeter according to Ubbelohde.		Y	1	Mekelburger (2007), Doc. No. 214-002;, B3.11/02	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
	OECD guideline 114	[redacted]	Kinematic viscosity: 1.22 $mm^2 s^{-1}$ at 20 °C The determination of the kinematic viscosity was carried out by the capillary method with a viscosimeter according to Ubbelohde.		Y	1	Mekelburger (2007), Doc. No. 214-001, B3.11/01	
3.15 Explosive properties (IIA3.11)								
	EEC Directive 92/69 A 14	[redacted]	Not explosive: no mechanical and thermal sensitivity	--	Y	1	Mekelburger (2007), Doc. No. 241-003; B3.2/02	
	EEC Directive 92/69 A 14	[redacted]	Not explosive: no mechanical and thermal sensitivity		Y	1	Mekelburger (2007), Doc. No. 241-002; B3.2/01	
		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Swern (1970), Doc. No. 192-003; A3.1.2/02	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
			[redacted]					
	Specific test design using an apparatus made of Duranglass	[redacted]	In the headspace of equilibrium solutions containing 10% and 30% peracetic acid, explosive atmospheres formed at temperatures starting at ca. 55°C. For a 40% solution, the respective starting temperature, at which the formation of explosive atmospheres began, was determined to be 49°C. It should be noted that the acetic acid contents of the tested products were high, so that the results cannot be transferred to the theoretical products of the dossier. It is important to mention that these investigations were not performed according to any standardized test methodology.		N	2	Kratz (1977), Doc. No. 241-006; A3.15/01 Post-submitted July 2009	
3.16 Oxidizing properties (IIA3.12)			[redacted]	[redacted]				

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	Method	Purity/ Specification	Results	Remarks/ Justification	GLP (Y/N)	Reliability	Reference	Official use only
				[redacted]				
3.17 Reactivity towards container material (IIA3.13)		[redacted]					Anonymous, 2001, Doc. No. 092-003; A3.1.1/01 MSDSs See Doc I, Appendix 8	

Section A3 **Physical and Chemical Properties of Active Substance**

Subsection (Annex Point)	**Method**	**Purity/ Specification**	**Results**	**Remarks/ Justification**	**GLP (Y/N)**	**Reliability**	**Reference**	**Official use only**
		[redacted]						

[redacted]The composition of [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Section A4.2b/01
Annex Point IIA IV.4.2

Analytical Methods for Detection and Identification of Peracetic acid and Hydrogen peroxide in Air

Official use only

1 REFERENCE

1.1 Reference	Hecht, G., Héry, M., Hubert, G. and Subra, I. (2004): "Simultanous Sampling of Peroxyacetic Acid and Hydrogen Peroxide in Workplace Atmospheres", Ann. occup. Hyg. **2004**, 48, 715-721; Doc. No. 436-003 (published)
1.2 Data protection	No
1.2.1 Data owner	Not applicable: publication
1.2.2 Companies with letter of access	Not relevant: publication
1.2.3 Criteria for data protection	No data protection claimed

2 GUIDELINES AND QUALITY ASSURANCE

2.1 Guideline study	No
2.2 GLP	No
2.3 Deviations	Not relevant: no guideline study

3 MATERIALS AND METHODS

3.1 Preliminary treatment	--
3.1.1 Enrichment	Peracetic acid is adsorbed on "basic" silica gel impregnated with MTSO (methyl-p-tolylsulfoxide). Hydrogen peroxide is adsorbed on quartz fibre filters impregnated with titanium oxysulfate.
3.1.2 Cleanup	No clean-up necessary.
3.2 Detection	--
3.2.1 Separation method	PAA reacts with MTSO to MTSOO. MTSOO is separated by RP-HPLC C18. Hydrogen peroxide: H_2O_2 is derivatised by the reaction with titanium oxysulfate to titanium peroxysulfate. No separation necessary.
3.2.2 Detector	MTSOO: UV 224 nm Titanium peroxysulfate: UV 410 nm

Section A4.2b/01 Analytical Methods for Detection and Identification of Peracetic acid and Hydrogen peroxide in Air

Annex Point IIA IV.4.2

3.2.3	Standard(s)	No information available
3.2.4	Interfering substance(s)	No interfering substances reported
3.3	**Linearity**	Detailed quantitative calibration data is not stated in the publication. However, due to the recovery rates found in the test on sampling efficiency (see 3.5) and the test on storage stability of used sample tubes (see 4.1), it can be assumed that the analytical procedure to determine hydrogen peroxide and peracetic acid in air is valid.
3.3.1	Calibration range	see 3.3
3.3.2	Number of measurements	see 3.3
3.3.3	Linearity	see 3.3

Section A4.2b/01 Analytical Methods for Detection and Identification of Peracetic acid and Hydrogen peroxide in Air

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3.4 Specifity: interfering substances

No interfering substances reported

3.5 Recovery rates at different levels

To test the efficiency of the sampling device (described in detail under 4.1), hydrogen peroxide and PAA were introduced in the sampling system by depositing a known quantity of commercial equilibrium PAA on a fibre filter, which was connected to the cassette/tube device. An air stream was established through the device at a flow rate 1 L/min to vaporise the liquid and to enable the test items to pass through the two sampling units.

Five concentrations were tested in the sampling efficiency test. For each concentration, four cassette / tube devices, four titanium oxysulfate references and four MTS references were taken or prepared respectively (reference sampling procedures are described below). The following table shows the concentrations determined via the reference sampling system and the respective percentages of those concentrations found via the simultaneous sampling method:

Series	Reference concentration [ppm] (RSD %)		Recovery [%] (RSD %)	
	H_2O_2	PAA	H_2O_2	PAA
I	2.09 (1.0)	1.61 (1.8)	92.8 (4.2)	95.3 (2.6)
II	3.75 (0.5)	2.99 (5.4)	95.0 (8.0)	96.0 (1.6)
III	0.42 (4.4)	0.23 (1.0)	87.0 (9.0)	96.9 (5.3)
IV	0.32 (3.2)	0.23 (1.1)	92.5 (7.2)	94.0 (5.1)
V	0.59 (1.9)	0.47 (0.7)	91.2 (3.5)	95.2 (1.1)
		Mean	91.7	95.5
		RSD [%]	6.2	3.4

Reference sampling procedures:

Two other sampling procedures were run in parallel. The same quantities of Equilibrium PAA as sampled with the sampling device were injected directly into:

1) a solution of titanium oxysulfate. The analysis of this solution gives the total amount of peroxides, i.e. the sum hydrogen peroxide and PAA (in contrast to the air sampling device, in this case the PAA can react with the titanium oxysulfate).
2) a solution of MTS (methyl-tolyl-sulfide). MTS reacts with PAA to MTSO which was analysed and yielded the concentration of PAA in the deposit sample. This MTS → MTSO reaction was preferred as a reference to the MTSO → MTSOO reaction because the latter does not work properly in the liquid phase.

The concentrations of hydrogen peroxide were determined by calculating the difference between the results of the concentrations of the total peroxides and the concentrations of PAA. Quantitative efficiency data is given in the above table.

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Annex Point IIA IV.4.2

		Storage stability test on PAA: The conservation of PAA sampled on the tubes was tested. Twenty five samples were taken according to the method described above. The quantity was chosen to correspond to an atmospheric concentration close to the TLV-STEL sampled for 15 min. (0.5 ppm). Five parallel reference samples (MTS solution into which the same quantity of PAA was directly injected) were also prepared and analysed on Day 0. The 25 samples were then separated randomly into five series of five and desorbed and analysed after 3, 8, 21 and 35 days. The recovery rates found decreased slowly from Day 0 to Day 35. However, after 35 days, a mean recovery rate of 90 % was found. Therefore, it can be assumed that the analytical method established is suitable for taking samples in the field and storing the tubes for a few days until analysis. Hydrogen peroxide filters should be desorbed immediately after sampling because the complex formed is only stable in solution.
3.5.1	Relative standard deviation	see 3.5
3.6	**Limit of determination**	In the test on the efficiency of the sampling method, the lowest quantified concentrations were: PAA: 0.23 ppm H_2O_2: 0.32 ppm
3.7	**Precision**	--
3.7.1	Repeatability	see 3.5
3.7.2	Independent laboratory validation	Not performed

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Analytical Methods for Detection and Identification of Peracetic acid and Hydrogen peroxide in Air

4 APPLICANT'S SUMMARY AND CONCLUSION

4.1 Materials and methods

A special sampling device was developed for the simultaneous sampling of PAA and hydrogen peroxide in air. The device consists of a set of quartz fibre filters impregnated with titanium oxysulfate, to sample hydrogen peroxide (cassette) and a tube filled with basic silica gel impregnated with MTSO. Air samples are first directed through the titanium oxysulfate impregnated filters and then through the MTSO impregnated silica gel.

The filters impregnated with titanium oxysulfate sample hydrogen peroxide. The flow rate has to be chosen high enough so that the PAA could pass the titanium oxysulfate soaked filter without reaction. PAA is sampled by the MTSO impregnated silica gel under formation of MTSOO.

Preparation of coating reagents:

For the preparation of the filter coating solution for hydrogen peroxide sampling, $TiOSO_4$ (2.1 g) is dissolved in 50 mL of 0.9 M H_2SO_4. For the preparation of the silica gel coating solution, 106 g Na_2CO_3 is dissolved in 200 mL of water. After complete dissolution, 100 g of silica gel are added. The mixture is dried at 90°C for 8h and then overnight at 140°C. After cooling, the "basic" silica gel obtained is then sifted to obtain the 0.25 – 0.5 mm range. MTSO (154 mg) is dissolved in 50 mL of methanol. 50 g of "basic" silica gel are added to the mixture. The solvent is then evaporated at 50°C under light vacuum.

Sampling materials:

Polyethylene frit 20 µm, Alltech ref. 211404

Quartz fibre filter (QM-A) 25 mm, Whatman ref. 1851025

Sampling cassette: 25 mm, Millipore ref. M000025A0

SPE 3 mL glass tube

Teflon frit, pore size 20 µm

SPE 4 mL polypropylene tube, Alltech ref. 210104

Preparation of the cassettes for HP sampling:

Two 25-mm quartz fibre filters are placed in the lower part of a cassette at 60°C. They are soaked with 210 µL of the coating solution, then dried for 1 h in a drying oven. The cassette is then closed and ready to use.

Preparation of the tubes for PAA sampling:

Coated silica gel 800 mg is packed into the glass (or polypropylene frits for polypropylene tubes).

The cassettes and tubes are sampled at a flow rate of 1 L/min.

Sample preparation:

Immediately after sampling, the cassettes are desorbed with 5 – 10 mL of molar sulphuric acid. The solution is then made up to 10 mL. After sampling, 5 mL of acetonitrile are percolated through a tube containing the coated silica gel prepared to sample PAA. The resulting solution is then made up to 10 mL with water.

Analytical apparatus:

Molecular absorption spectrometry for the analysis of hydrogen peroxide (Perkin Elmer Lambda 11 at 410 nm) is used.

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Annex Point IIA IV.4.2

Two Shimadzu LC-10AT VP pumps are used for the HPLC analysis.

Gradient and data acquisition and processing are controlled by Varian Star (version 5) software.

Reversed phase Kromasil C18 column are used to analyse MTSO and MTSOO. Mobile phase: 57/43 acetonitrile/water mixture.

Detection: Perkin Elmer 785 A UV detector at 224 nm.

4.2 Conclusion

A specific sampling device was developed. It is composed of:

(i) a cassette with quartz fibre filters impregnated with titaniumoxysulfate hydrate for the sampling of hydrogen peroxide followed by

(ii) a tube filled with silica gel soaked with methyl p-tolylsulfoxide for the sampling of PAA. Hydrogen peroxide was quantified via the titanium peroxysulfate by molecular absorption spectrometry.

Titanium peroxysulfate is formed by the reaction of titanium oxysulfate with hydrogen peroxide. The quantification of PAA was performed by liquid chromatography with UV detection of the methyl-p-tolylsulfone generated by the sampling of PAA on basic silica gel. The conservation of the sampling media (before and after sampling) and its efficiency were also checked.

The method described provides a reliable determination of peracetic acid and hydrogen peroxide in air.

4.2.1 Reliability

2

4.2.2 Deficiencies

Reporting deficiencies: Detailed quantitative calibration data is not stated in the publication. However, due to the recovery rates found in the test on sampling efficiency (see 3.5) and in the test on storage stability of used sample tubes (see 4.1), it can be assumed that the analytical procedure to determine hydrogen peroxide and peracetic acid in air is valid.

Evaluation by Competent Authorities

	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and methods	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	Acceptable [redacted]
Remarks	
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Results and discussion	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant´s summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A4.2c/01
Annex Point IIA IV.4.2

Analytical Methods for Detection and Identification of Peracetic acid and Hydrogen peroxide in Water

Official use only

1 REFERENCE

1.1 Reference	Van Egdom, T.R. (2006): "Evaluation of the Degradation of Peracetic Acid and Hydrogen Peroxide in Effluent from a Waste Water Treatment Plant", Solvay Pharmaceuticals, Weesp, The Netherlands; Study No. E.SOL.S.025; Doc. No. 714-001 (unpublished).
1.2 Data protection	Yes
1.2.1 Data owner	Peracetic Acid Registration Group
1.2.2 Companies with letter of access	None
1.2.3 Criteria for data protection	Data on existing a.s. submitted for the first time for Annex I entry

2 GUIDELINES AND QUALITY ASSURANCE

2.1 Guideline study	No
2.2 GLP	Yes
2.3 Deviations	Not relevant: no guideline study

3 MATERIALS AND METHODS

3.1 Preliminary treatment	In the method described in the following, no enrichment is involved.
3.1.1 Enrichment	Peracetic acid oxidises methyl-p-tolyl-sulfide to methyl-p-tolyl-sulfoxide). MTSO is detected via RP-HPLC with UV detection. No enrichment of PAA or of the reaction product (MTSO) is involved in this method. H_2O_2 is enzymatically reduced with peroxidase in the presence of 4-amino-antipyrine and phenol. Under these conditions, 4-(benzoquinone-mono-imino)-phenoxon is formed, a red complex molecule which is quantified photometrically at 505 nm. No enrichment of H_2O_2 or 4-(benzoquinone-mono-imino)-phenoxon is involved in this method.
3.1.2 Cleanup	No purification necessary
3.2 Detection	--

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3.2.1 and 3.2.2	Separation method and Detector	MTSO as reaction product of the oxidation of MTS with PAA: RP-HPLC with UV detection (225 nm) 4-(benzoquinone-mono-imino)-phenoxon as reaction product of H_2O_2: no separation necessary. Photometric detection at 505 nm
3.2.3	Standard(s)	MTSO: external (commercially available) H_2O_2 via 4-(benzoquinone-mono-imino)-phenoxon): external (obtained via the same reaction as applied for the test substance)
3.2.4	Interfering substance(s)	None
3.3	**Linearity**	--
3.3.1	Calibration range	MTSO: 0.2, 0.4, 1.0, 2.0, 4.0, 10.0 and 20.0 mg/L corresponding to 0.1, 0.2, 0.5, 1.0, 2.0, 5.0 and 10 mg/L PAA H_2O_2 via 4-(benzoquinone-mono-imino)-phenoxon): 0.1, 0.2, 0.4, 0.8, 1.6, 2.0 and 2.4 mg H_2O_2 /L
3.3.2	Number of measurements	Seven calibration standards were used for MTSO and for H_2O_2 (determined as 4-(benzoquinone-mono-imino)-phenoxon).
3.3.3	Linearity	r^2 = 1.0000 for MTSO r^2 = 0.9999 for H_2O_2 (determined as 4-(benzoquinone-mono-imino)-phenoxon)
3.4	**Specifity: interfering substances**	**PAA:** The method to determine PAA described in the present study has also been used in a study to determine the degradation of PAA in diluted blood solutions. During the study (see Doc. IIIA, Section A4.2d/01, Doc. No. 593-001), the specificity of the method was shown by the following procedure: Two solutions, both containing MTSO were injected into the chromatographic system. One was a 10 mg/L MTSO standard solution. The other contained 10 mg/L MTSO which was formed by the reaction of PAA and MTS. In both cases, a peak for MTSO appeared in the chromatogram at the same retention time. Injection of a blank solution did not give a relevant peak at the same retention time of MTSO in the chromatogram. Therefore, it can be concluded that the method is specific for MTSO. **H_2O_2**: Not reported. However, enzymes (bio catalysts) are typically very specific on the type of reaction they catalyse and on the substrates which are involved in the reaction. Hence, it can be assumed that the enzyme used in this method does specifically reduce hydrogen peroxide and that other peroxides or substances do not interfere.
3.5	**Recovery rates at different levels**	**PAA:** The method to determine PAA described in the present study has also been used in a study to determine the degradation of PAA in diluted blood solutions. During the study (see Doc. IIIA, Section A4.2d/01,

Section A4.2c/01 Analytical Methods for Detection and Identification of Peracetic acid and Hydrogen peroxide in Water

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	Doc. No. 593-001), the reaction efficiency (MTS → MTSO) and recovery rates were determined as follows: The reaction efficiency and recovery rates were determined at 0, 0.1, 1.0 and 5.0 mg PAA/L, which corresponds to 0, 0.2, 2.0 and 10.0 mg MTSO/L. All concentrations were run in duplicate. In the solutions without PAA no detectable amounts of MTSO were observed. A calibration curve was established (r = 1.0000). The reaction efficiency, calculated via the relation of the calibration curve for MTSO obtained from PAA and MTS, to the calibration curve obtained for MTSO standard, was 104.9 % (RSD = 2.4 %). **H_2O_2:** Not reported
3.5.1 Relative standard deviation	**PAA:** see 3.5 **H_2O_2:** Not reported
3.6 Limit of determination	**PAA:** The method to determine PAA described in the present study has also been used in a study to determine the degradation of PAA in diluted blood solutions. During that study (see Doc. IIIA, Section A4.2d/01, Doc. No. 593-001), the following LOQ was determined: LOQ = 0.02 mg PAA/L (this value was determined in the system suitability test) **H_2O_2:** Not reported
3.7 Precision	--
3.7.1 Repeatability	**PAA:** Six samples of 10 mg/L MTSO and two blanks were injected. RSD_r = 0.37 % (n = 6) **H_2O_2:** Not reported
3.7.2 Independent laboratory validation	Not performed
	4 APPLICANT'S SUMMARY AND CONCLUSION
4.1 Materials and methods	The study investigated the degradation of PAA and H_2O_2 in STP effluent water. Before the experiments were started, the method for PAA was validated for linearity and repeatability. According to specificity and recovery (reaction efficiency), a similar method used for the determination of PAA proved to be valid in a study to determine the degradation of PAA in diluted blood samples (see Doc. IIIA, Section A4.2d/01, Doc. No. 593-001). Besides the data on the calibration curve, no other validity data on the method to determine H_2O_2 in effluent water is stated in the original report. However, a so-called “system suitability test was performed and was passed”. **PAA:**

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Annex Point IIA IV.4.2

Principle:

The amount of PAA is determined by oxidation of methyl-p-tolyl-sulfide (MTS) to methyl-p-tolyl-sulfoxide (MTSO), which is stable in a solution for several days. The amount of MTS in a solution must be at least twice as much as the expected PAA amount to ensure a quantitative reaction. MTSO is determined by reversed phase HPLC with UV detection.

Chromatographic conditions:

Column: 5 cm x 2 mm ID x 3 µm Inertsil ODS-3 (HESO3K06)

Mobile phase A: 1.278 g ammonium formate dissolved in 1900 mL water set to pH 3 with formic acid. 100 mL methanol are added and the solution is homogenised and degassed with helium.

Mobile phase B: 1.251 g ammonium formate dissolved in 100 mL water and set to pH 3 with formic acid. 1900 mL methanol are added and the solution is homogenised and degassed with helium.

Injection volume 20 µL

Oven temperature: 30°C

Flow: 0.5 mL/min

Wavelength: 225 nm

Gradient:

Time [min]	**% Mobile phase A**	**% Mobile phase B**
0	80	20
4	80	20
5	65	35
5.01	0	100
7	0	100
7.01	80	20
10	80	20

H_2O_2:

Principle:

H_2O_2 is enzymatically reduced with peroxidase in the presence of 4-amino-antipyrine and phenol. Under these conditions 4-(benzoquinone-mono-imino)-phenoxon is formed, a red complex molecule which is quantified photometrically at 505 nm.

4.2 Conclusion

During the course of a study for the determination of the degradation of PAA and H_2O_2 in effluent water, a method for the determination of PAA and H_2O_2 in effluent water has successfully been established.

The amount of PAA is determined by oxidation of methyl-p-tolyl-sulfide (MTS) to methyl-p-tolyl-sulfoxide (MTSO), which is stable in a solution for several days. MTSO is determined by reversed phase HPLC with UV detection.

H_2O_2 is enzymatically reduced with peroxidase in the presence of 4-amino-antipyrine and phenol. 4-(benzoquinone-mono-imino)-phenoxon is formed, a red complex molecule which is quantified photometrically at 505 nm.

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Annex Point IIA IV.4.2

4.2.1 Reliability	2
4.2.2 Deficiencies	Yes (Reporting deficiencies): Some validation data is not reported for PAA. Since the method for the determination of PAA is very similar to the successfully validated method for the determination of PAA in diluted rat blood (see Doc. IIIA, Section A4.2d/01, Doc. No. 593-001), it is considered that these reporting deficiencies do not affect the validity of the study. For H_2O_2, only the linearity of the calibration curve is reported as a validity criterion. However, in the report it is stated that a "system suitability test was performed and was passed". According to the TNsG on data requirements, for Section A4.2 "Analytical methods (...) for the active substance" have to be provided and considering that the active substance addressed in this dossier is peracetic acid and not H_2O_2, the analytical method for the determination of H_2O_2 should be regarded as additional information. **The lack of detail in reporting of validity data does not affect the validity of the study to fulfil the data requirement for this section.**

	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and methods	[redacted]

Section A4.2c/01 Analytical Methods for Detection and Identification of Peracetic acid and Hydrogen peroxide in Water

Annex Point IIA IV.4.2

Conclusion	[redacted]
Reliability	[redacted]
Acceptability	Acceptable [redacted]
Remarks	
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Results and discussion	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant´s summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*

Section A4.2c/01 Analytical Methods for Detection and Identification of Peracetic acid and Hydrogen peroxide in Water

Annex Point IIA IV.4.2

Remarks

Section A4.2d/01 Analytical Methods for Detection and Identification of Peracetic acid in Blood

Annex Point IIA IV.4.2

			Official use only
		1 REFERENCE	
1.1	**Reference**	[redacted] (2005): "Degradation of Peracetic Acid in Diluted Rat Blood (HPLC Method)", [redacted]; Doc. No. 593-001 (unpublished).	
1.2	**Data protection**	Yes	
1.2.1	Data owner	Peracetic Acid Registration Group	
1.2.2	Companies with letter of access	None	
1.2.3	Criteria for data protection	Data on existing a.s. submitted for the first time for Annex I entry.	
		2 GUIDELINES AND QUALITY ASSURANCE	
2.1	**Guideline study**	No	
2.2	**GLP**	Yes	
2.3	**Deviations**	Not relevant: no guideline study	
		3 MATERIALS AND METHODS	
3.1	**Preliminary treatment**	In the method described in the following, no enrichment is involved.	
3.1.1	Enrichment	Peracetic acid oxidises methyl-p-tolyl-sulfide to methyl-p-tolyl-sulfoxide). MTSO is detected via RP-HPLC with UV detection. No enrichment of PAA or of the reaction product (MTSO) is involved in this method.	
3.1.2	Cleanup	No purification necessary.	
3.2	**Detection**	--	
3.2.1	Separation method	MTSO: RP-HPLC	
3.2.2	Detector	MTSO: UV 225 nm	
3.2.3	Standard(s)	MTSO, external (commercially available)	
3.2.4	Interfering substance(s)	None	

Section A4.2d/01 Analytical Methods for Detection and Identification of Peracetic acid in Blood

Annex Point IIA IV.4.2

3.3	**Linearity**	To check the linearity, an amount of 20.06 mg MTSO standard was weighed in a volumetric flask of 100 mL and made up to volume. Of this solution 0.1, 0.2, 0.5, 1.0, 2.0, 5.0 and 10.0 mL were made up to 100 mL in a volumetric flask, resulting in standards of concentrations given below under 3.3.1.
3.3.1	Calibration range	MTSO: 0.2, 0.4, 1.0, 2.0, 4.0, 10.0 and 20.0 mg/L corresponding to 0.1, 0.2, 0.5, 1.0, 2.0, 5.0 and 10 mg/L PAA
3.3.2	Number of measurements	Seven calibration standards were used for MTSO.
3.3.3	Linearity	$r^2 = 0.9999$ for MTSO
3.4	**Specifity: interfering substances**	The injection of a standard solution MTSO (10 mg/L) and of a solution in which MTS and PAA reacted to MTSO (10 mg/L) resulted in both cases in a peak for MTSO in the chromatogram at the same retention time. Injection of a blank did not give a relevant peak at the retention time of MTSO in the chromatogram. Therefore, it can be concluded that the method is specific for MTSO.
3.5	**Recovery rates at different levels**	Recovery rates for PAA cannot be determined, due to the fast degradation of PAA in blood samples. However, directly after addition of PAA to diluted blood samples, significant amounts of PAA were determined. This indicates that the method applied is valid for the determination of PAA in blood samples. The reaction efficiency was determined at 0, 0.1, 1.0 and 5.0 mg PAA/L which correspond to 0, 0.2, 2.0 and 10.0 mg MTSO/L. All concentrations were run in duplicate. In the solutions without PAA, no detectable amounts of MTSO were observed. A calibration curve was established (r = 1.0000). The reaction efficiency, which was calculated via the relation of the calibration curve for MTSO obtained from PAA and MTS to the calibration curve obtained for MTSO standard, was 104,9 % (RSD = 2.4 %).
3.5.1	Relative standard deviation	see 3.5
3.6	**Limit of determination**	LOQ = 0.02 mg PAA/L (this value was determined in the system suitability test; not in blood.) In the table listing the PAA concentrations as a function of time (in the original report), concentrations lower than 0.1 mg PAA/L are stated as < 0.1 mg/L, despite the LOQ of 0.02 mg PAA/L.
3.7	**Precision**	--
3.7.1	Repeatability	Six samples of 10 mg/L MTSO and two blanks were injected. $RSD_r = 0.1$ % (n = 6)
3.7.2	Independent laboratory validation	Not performed

Section A4.2d/01 Analytical Methods for Detection and Identification of Peracetic acid in Blood

Annex Point IIA IV.4.2

4 APPLICANT'S SUMMARY AND CONCLUSION

4.1 Materials and methods

The study investigated the degradation of PAA in blood (applied as [redacted]). Before the experiments were started, the method was validated on specificity, linearity and reaction efficiency (recovery). Results of the validation are given in 3.3 – 3.7.

Principle:

The amount of PAA is determined after oxidation of methyl-p-tolyl-sulfide (MTS) to methyl-p-tolyl-sulfoxide (MTSO), which is stable in a solution for several days. The amount of MTS in a solution must be at least twice as much as the expected PAA amount to ensure a quantitative reaction. MTSO is determined by reversed phase HPLC with UV detection.

Chromatographic conditions:

Column: 5 cm x 2 mm ID x 3 µm Inertsil ODS-3 (HESO3K06)

Mobile phase A: 1.278 g ammonium formate dissolved in 1900 mL water set to pH 3 with formic acid. 100 mL methanol are added and the solution is homogenised and degassed with helium.

Mobile phase B: 1.251 g ammonium formate is dissolved in 100 mL water and set to pH 3 with formic acid. 1900 mL methanol are added and the solution is homogenised and degassed with helium.

Injection volume 20 µL

Oven temperature: 30°C

Flow: 0.5 mL/min

Wavelength: 225 nm

Gradient:

Time [min]	% Mobile phase A	% Mobile phase B
0	80	20
4	80	20
5	65	35
5.01	0	100
7	0	100
7.01	80	20
10	80	20

The experiments on the degradation in blood are described in the following.

A stock solution was prepared on the day of test initiation by dissolving 0.60 mL [redacted] in 100 mL purified water resulting in PAA concentration of 1000 mg/L. Two test solutions were prepared by adding PAA (0.1 or 0.5 mL of stock solution) to almost 100 mL physiological salt solution in a volumetric flask. As the next step, 0.1 mL rat blood was added (dilution factor of 1000). To a third volumetric flask of 100 mL, also containing almost 100 mL physiological salt solution, 0.5 mL stock solution PAA (1000 mg/L) was added to determine the degradation of PAA in physiological salt solution in the absence of rat blood.

Section A4.2d/01 Analytical Methods for Detection and Identification of Peracetic acid in Blood

Annex Point IIA IV.4.2

To check the influence of lithium heparin on PAA, a syringe with lithium heparin pellets was filled with physiological salt solution. 0.1 mL of this solution was added to a volumetric flask containing 100 mL of 5.0 mg/L PAA in physiological salt solution.

The test solution without rat blood was placed in a shaking water bath at 37 °C for approx. 15 min. Afterwards, the rat blood was added and the solutions were homogenised.

After 0, 5, 15, 30, 60, 120, and 240 minutes, 1.0 mL of test solution was analysed by derivatisation of MTS to MTSO and HPLC analysis of MTSO.

Results of the degradation tests:

The results of the degradation tests are summarised in the following table. Concentrations lower than the lowest calibration point (0.1 mg/L) are stated as < 0.1 mg/L, despite the LOQ of 0.02 mg/L.

Sample	Concentration PAA after ... [mg/L]						
	0 min	5 min	15 min	30 min	60 min	120 min	240 min
1.0 mg PAA / L with blood	0.38	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
5.0 mg PAA / L with blood	3.06	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
5.0 mg PAA / L without blood	4.96	4.74	4.62	4.47	3.99	3.41	2.45

In the PAA solution without blood, the measured concentration of PAA (4.96 mg/L) was close to the nominal concentration (5.0 mg/L) directly after addition of the blood to the other samples. After 240 minutes, the measured concentration in this solution was 2.45 mg/L, indicating a half-life of about 4 hours.

In the PAA solutions with diluted blood, the measured concentration of PAA (0.38 and 3.96 mg/L) was significantly lower than the nominal concentration (1.0 and 5.0 mg/L) directly after addition of blood, indicating a rapid degradation of PAA. The measured concentration was below 0.1 mg/L in both solutions after 5 minutes, showing that the half-life of PAA is significantly less than 5 minutes in 1000 times diluted rat blood.

The presence of diluted lithium heparin in a 5.0 mg/L PAA solution for 30 minutes resulted in a measured concentration of PAA of 5.77 mg/L indicating that lithium heparin does not effect the degradation of PAA in physiological salt solution.

4.2 Conclusion

A method for the determination of the degradation of PAA in diluted rat blood has successfully been validated.

The fact that directly after addition of PAA to the diluted blood samples, significant amounts of PAA could be determined shows that the method is valid for the determination of PAA in blood.

However, it was also shown that PAA degrades rapidly in 1000 fold diluted rat blood with a half-life significantly lower than 5 minutes.

4.2.1 Reliability 1

4.2.2 Deficiencies No

Section A4.2d/01 Analytical Methods for Detection and Identification of Peracetic acid in Blood

Annex Point IIA IV.4.2

	Evaluation by Competent Authorities
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted
	EVALUATION BY RAPPORTEUR MEMBER STATE
Date	[redacted]
Materials and methods	[redacted]
Conclusion	[redacted]
Reliability	[redacted]
Acceptability	Acceptable
Remarks	
	COMMENTS FROM ...
Date	*Give date of comments submitted*
Results and discussion	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant´s summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Acceptability	*Discuss if deviating from view of rapporteur member state*
Remarks	

Section A4.2c **Annex Point IIA, IV.4.2**	**Analytical method for the detection and identification of peracetic acid in natural sediment**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	**Official use only**
Other existing data [ ] **Limited exposure [ ]**	**Technically not feasible [ ]** **Scientifically unjustified [X]** **Other justification [ ]**	
Detailed justification:	[redacted]	
	Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	Applicant's justification is acceptable.	
Remarks		
	COMMENTS FROM ...	
Date		
Evaluation of applicant's justification		
Conclusion		
Remarks		

Section A4.2a **Annex Point IIA IV.4.2**	**Analytical Methods for Detection and Identification of Peracetic acid in soil**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ] **Limited exposure [ ]**	**Technically not feasible [ ]** **Scientifically unjustified [X]** **Other justification [x]**	
Detailed justification:	[redacted] • [redacted]	
	Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	Applicant's justification is acceptable.	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		

Section A4.2e **Annex Point IIA,IV.4.2 (e)**	**Analytical Methods for Detection and Identification of Peracetic acid in food and feeding stuffs and other products where relevant**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ] **Limited exposure [ ]**	**Technically not feasible [ ]** **Scientifically unjustified [X]** **Other justification [x]**	
Detailed justification:	[redacted]	
	Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted	
	EVALUATION BY RAPPORTEUR MEMBER STATE	
Date	[redacted]	
Evaluation of applicant's justification	[redacted]	
Conclusion	Applicant's justification is acceptable.	
Remarks		
	COMMENTS FROM OTHER MEMBER STATE *(specify)*	
Date	*Give date of comments submitted*	
Evaluation of applicant's justification	*Discuss if deviating from view of rapporteur member state*	
Conclusion	*Discuss if deviating from view of rapporteur member state*	
Remarks		