Section A1 Annex Point IIA I.	**IDENTITY OF APPLICANT**

Section A1.1 Annex Point IIA I.1.1	**Central Address**	Lučební závody Draslovka a. s. Kolín Havlíčkova 605 280 99 Kolín, Česká Republika
	Telephone	+420 321 335 111
	Facsimile	+420 321 724 133
	Contact	[redacted]

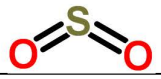
Section A1.2 Annex Point IIA I.1.2	**Manufacturer**	
		[redacted]
	Telephone	+420 321 335 251
	Facsimile	+420 321 724 133
	Contact	Ing. Jarmila Málková, Head of System Management Department E-mail: jarmila.malkova@draslovka.cz

Section A2 Annex Point IIA II.	**IDENTITY OF ACTIVE SUBSTANCE**

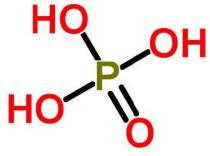
2.1	**Common name proposed or accepted by ISO and synonyms**	
2.1.1	IUPAC Name	Hydrogen cyanide *(active substance)*
2.1.2	Synonyms	Hydrocyanic acid Prussic acid

2.2	Chemical name	Hydrogen cyanide
2.3	Manufacturer´s development code number	Not given
2.4	CAS and EC numbers	
2.4.1	CAS:	74-90-8 *(active substance)*
2.4.2	EINECS:	200-821-6 *(active substance)*
2.4.3	Other ELINCS: CIPAC:	 Not available Not available
2.5	Molecular and structural formula, molecular mass	
2.5.1	Molecular formula:	HCN *(active substance)*
2.5.2	Structural formula:	
2.5.3	Molecular mass	27.03 g/mol
2.6	Method of manufacture of the active substance	Hydrogen cyanide is produced by the Andrussov method – by methane (or natural gas) ammoxidation. It is a continuous process with ammonia, natural gas and air as base materials. The reaction proceeds on a PtRh 10 alloy catalyst, at 1,020-1,100°C (1,868-2,012°F), with heat generation, according to the following stoichiometric equation: $NH_3 + CH_4 + 1.5\ O_2 \longrightarrow HCN + 3H_2O +$ 481kJ
2.7	Specification of purity of the active substance, as appropriate	Min. 97.6 % w/w

2.8	Impurities			
	CAS number	**Chemical name**	**Concentration or concentration range (% wt)**	**Note**
Substance 1	7446-09-5	Sulphur dioxide	0.9 – 1.1	Stabilizing additive preventing spontaneous polymerisation
Substance 2	7664-38-2	Phosphoric acid	0.08 - 0.12	Stabilizing additive preventing spontaneous polymerisation
Substance 3	7732-18-5	Water (oxan)	1.18 – 1.42	

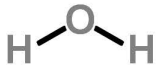
	Substance 1	
	IUPAC name	Sulphur dioxide
	CAS No	7446-09-5
	EC No.: EINECS	231-195-2
	Other	
	Molecular formula	SO_2
	Structural formula	
	Molecular mass	64
	Concentration of the impurity or additive	0.9 – 1.1 % w/w

	Current classification
	Classification in compliance with Annex VI Regulation (EC) No 1272/2008
Hazard classification and Category Code(s)	Press. Gas Acute Tox. 3 (*) Skin Corr. 1B
Hazard statement Code(s)	H331 Toxic if inhaled. H314 Causes severe skin burns and eye damage.

	Substance 2	
	IUPAC name	Phosphoric acid
	CAS No	7764-38-2
	EC No.: EINECS	231-633-2
	Other	
	Molecular formula	H_3PO_4
	Structural formula	
	Molecular mass	98
	Concentration of the impurity or additive	0.08-0.12 % w/w

	Current classification
	Classification in compliance with Annex VI Regulation (EC) No 1272/2008
Hazard classification and Category Code(s)	Skin Corr. 1B

Hazard statement Code(s)	H314 Causes severe skin burns and eye damage.

	Substance 3	
	IUPAC name	Water
	CAS No	7732-18-5
	EC No.: EINECS	231-791-2
	Other	
	Molecular formula	H_2O
	Structural formula	
	Molecular mass	18
	Concentration of the impurity or additive	1.18-1.42 % w/w
	Classification	no

	Evaluation by Competent Authorities
Date	
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Conclusion	
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Section A 3.1 **Annex Point IIA III.3.1**	**Melting point / solidification point**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Melting point -13,4 °C (**1**) -13,4 °C (**2**) Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature.	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. Budavari S, ed. 1989, Merck index: An encyclopedia of chemicals, drugs, and biologicals. 11 th ed. Rahway, NJ: Merck &Co., Inc. 2. Budavari, S. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. Whitehouse Station, NJ: Merck and Co., Inc., 1996., p. 822	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
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Section A3.1.1 **Annex Point IIA III.3.1**	**Boiling point**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN is liquid state is 25.7 °C (73.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Boiling point 25.7 °C (acid) (**1**) 25.6 °C (acid) (**2**) Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature.	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. Jenks WR. 1979 Cyanides. In: Grayson, M, ed. Kirk-Othmer encyclopaedia of chemical technology. New York, NY: John Wiley and Sons, Inc., 307-334 2. Budavari, S. (ed.). The Merck Index - An Encyclopaedia of Chemicals, Drugs, and Biologicals. Whitehouse Station, NJ: Merck and Co., Inc., 1996., p. 822	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
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Conclusion	
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Section A3.1.2 Annex Point IIA III.3.1	**Bulk Density / Relative density**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling point of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Density 0.6884 g/cm^3 (liquid at 20 °C/ 68 °F) (**1**) Density / Specific gravity 0.687 g/cm^3 (**2**) **Specific density: vapours 0.937 at 31 °C / 87.8 °F (3)** Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature.	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine's TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. Jenks WR. 1979 Cyanides. In: Grayson, M, ed. Kirk-Othmer encyclopaedia of chemical technology. New York, NY: John Wiley and Sons, Inc., 307-334 2. Lide, D.R. (ed.). CRC Handbook of Chemistry and Physics. 79th ed. Boca Raton, FL: CRC Press Inc., 1998-1999., p. 3-197 3. ACGIH (2001) Hydrogen cyanide and cyanide salts. In: Documentation of the threshold values and biological exposure indices, 8th ed. Cincinnati, OH, American Conference of Governmental Industrial Hygienists, pp. 1–6.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
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Conclusion	
Remarks	

Section A3.10 **Annex Point IIA III.3.7**	**Thermal Stability, identity of relevant breakdown products**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [x]** **Scientifically unjustified [x]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. No decomposition or sublimation occur at the solidification or boiling temperature.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.11 **Annex Point IIA III.3.8**	**Flammability**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid form is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Extremely flammable substance in the form of liquid. In the form of gas hydrogen cyanide forms explosive mixtures with air with these explosive limits: upper: 40 % vol. lower: 5.6 % vol. In alkali medium it may come under an autocatalytic polymerisation reaction running in an explosion speed. (**1**) Autoignition temperature 538 °C / 1,000.4 °F (**2**) Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: ATSDR (2004, Toxicological profile of cyanide) (**DOC IV_1**) and IPCS (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). (**DOC IV_5**) and Hazardous Substance Data Bank (HSDB), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* (**DOC IV_2**). Detailed justification: 1. Yoo et al. 1986, value at 25 °C and saturation 2. Jenks WR. 1979. Cyanides. In: Grayson, M, ed. Kirk-Othmer encyclopedia of chemical technology. New York, NY: John Wiley and Sons, Inc., 307-334.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.12 **Annex Point IIA III.3.9**	**Flash-point**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Flash point -17.8 °C / 0.04 °F (closed cup) (**1**) -18 °C / 0.4 °F (closed cup) (**2**) Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: ATSDR (2004, Toxicological profile of cyanide) (**DOC IV_1**) and IPCS (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). (**DOC IV_5**) and Hazardous Substance Data Bank (HSDB), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* (**DOC IV_2**). Detailed justification: 1. Jenks WR. 1979. Cyanides. In: Grayson, M, ed. Kirk-Othmer encyclopedia of chemical technology. New York, NY: John Wiley and Sons, Inc., 307-334. 2. Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.13 Annex Point IIA III.3.10	**Surface tension**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [x]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °C). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only.	
Undertaking of intended data submission	No studies planned.	

	Evaluation by Competent Authorities
Date	
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Conclusion	
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Section A3.14 **Annex Point *IIIA III0§****	**Viscosity**	
** III0§* = additional data in TNsG on data requirements, but not contained in the BPD*	**JUSTIFICATION FOR NON-SUBMISSION OF DATA**	Official use only
Other existing data [ ]	**Technically not feasible [x]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °C). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.15 **Annex Point IIA III.3.11**	**Explosive properties**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Active substance is readily flammable in contact with flame, sparks or at high temperature. It forms explosive mixtures with air. Not explosive within the meaning of regulations for classification of substances. Concentrations used during fumigations are below lower explosive limit. Active substance is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature. **(1)** Explosive limits: upper 40 % vol. lower 5.6 % vol.	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. HSDB 2006 Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.16 Annex Point IIA III.3.12	**Oxidizing properties**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed jusřtification:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Due to its chemical structure no oxidizing properties of hydrogen cyanide may be expected. Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.17 **Annex Point IIA III.3.13**	**Reactivity towards container material**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Detailed justification:	Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. Hydrogen cyanide is packed into cans made from thick sheet galvanised iron (wall thickness 0.45mm). Within more than 50 years of experience dry hydrogen cyanide has been not shown to react with this material. The air-tightness of cans has been tested using excess pressure of 600 kPa for 5 minutes and the can was certified for the intended use. Each can is after filling subjected to leakage test at an increased temperature.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
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Section A3.2.1 Annex Point IIA III.3.2	**Henry´s law constant**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Bowling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Henry´s law constant 5.2 kPa .m^3.mol^{-1} / 5.1x10^{-2} atm.m^3.mol^{-1} Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature.	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).**	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.2 Annex Point IIA III.3.2	**Vapour pressure**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Vapour pressure: 0.084 MPa (630 mm Hg) (at 20 °C / 68 °F) (**1**) Temperature interval: 0 °C / 32 °F……..0.035 MPa (**2**) 10 °C / 50 °F……..0.053 MPa 20 °C / 68 °F……..0.081 MPa 25 °C / 77 °F……..0.098 MPa 30 °C / 86 °F……..0.121 MPa 40 °C / 104 °F……..0.169 MPa Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature.	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. ATSDR 2004 - Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services: Draft Toxicological Profile for Cyanide, Sept. 2004, * Peer Reviewed*, str 141 2. Daubert, T.E., R.P. Danner. Physical and Thermodynamic Properties of Pure Chemicals Data Compilation. Washington, D.C.: Taylor and Francis, 1989.	
Undertaking of intended data submission	No study is planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.3.1 **Annex Point IIA III.3.3**	**Physical state**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Physical state (**1**) Active substance: Gas / colourless Manufacturing state: Liquid / colourless Drawn from relevant literature, visual observation	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine's TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. Budavari S, ed. 1989, Merck index: An encyclopaedia of chemicals, drugs, and biologicals. 11 th ed. Rahway, NJ: Merck &Co., Inc.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.3.2 **Annex Point IIA III.3.3**	**Colour**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Colour (**1**) Active substance: Gas / colourless Manufacturing state: Liquid / colourless Drawn from relevant literature, visual observation	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. Budavari S, ed. 1989, Merck index: An encyclopaedia of chemicals, drugs, and biologicals. 11 th ed. Rahway, NJ: Merck &Co., Inc.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.3.3 **Annex Point IIA III.3.3**	**Odour**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Smells of bitter almonds. Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature Olfactory threshold: 0.17 ppm (wt/vol.) in water (**1**) 0.58 ppm (vol./vol.) in air **(1)**	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. Budavari S, ed. 1989, Merck index: An encyclopedia of chemicals, drugs, and biologicals. 11 th ed. Rahway, NJ: Merck &Co., Inc.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.4 Annex Point IIA III.3.4.	**Spectra**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [x]**	
Detailed justification:	1) Spectra are not generally used for identification of HCN. 2) The structure of HCN molecule is extremely simple and permits easy prediction of spectra without dangerous manipulation with liquid HCN. 3) Where no measured spectra were found, predicted spectra are presented.	

	Evaluation by Competent Authorities	
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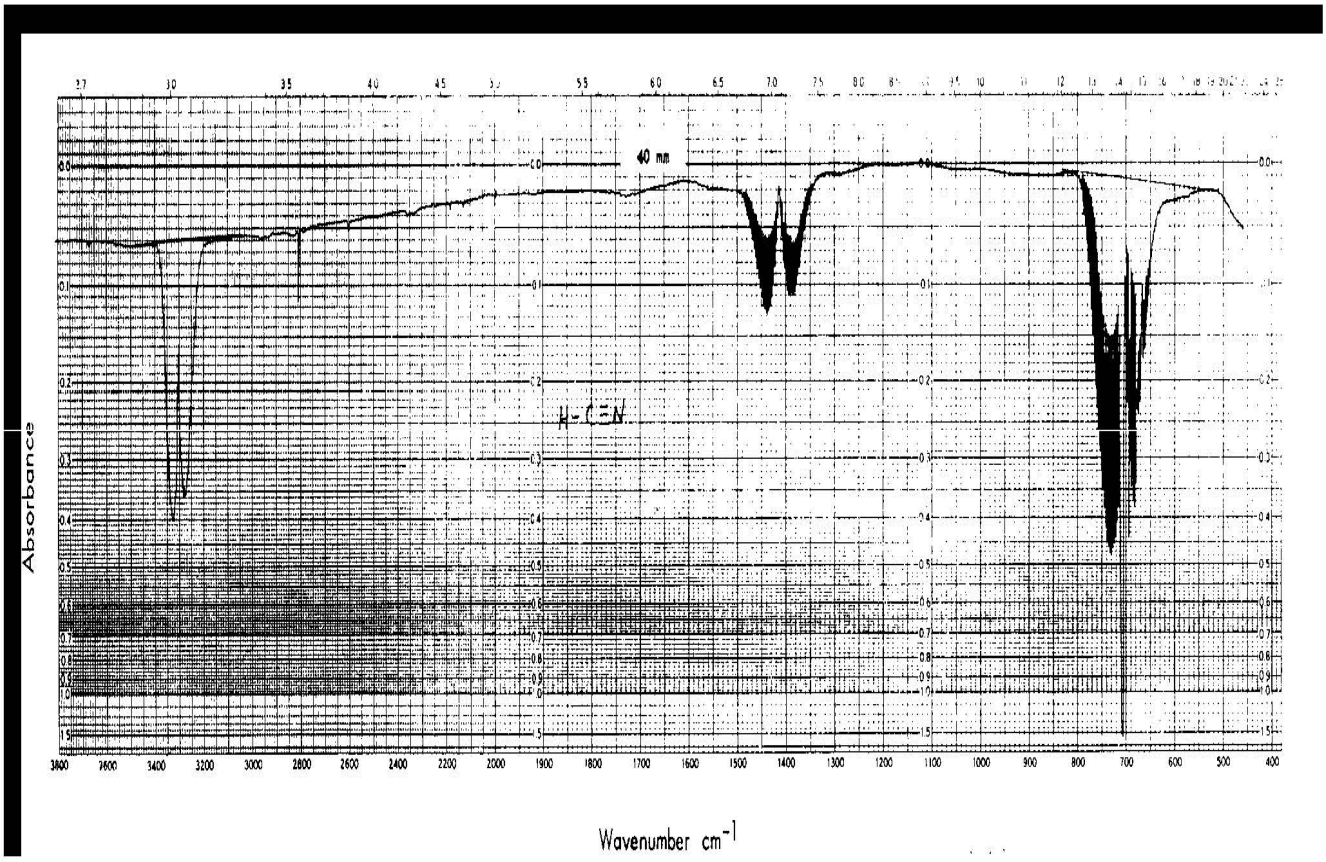
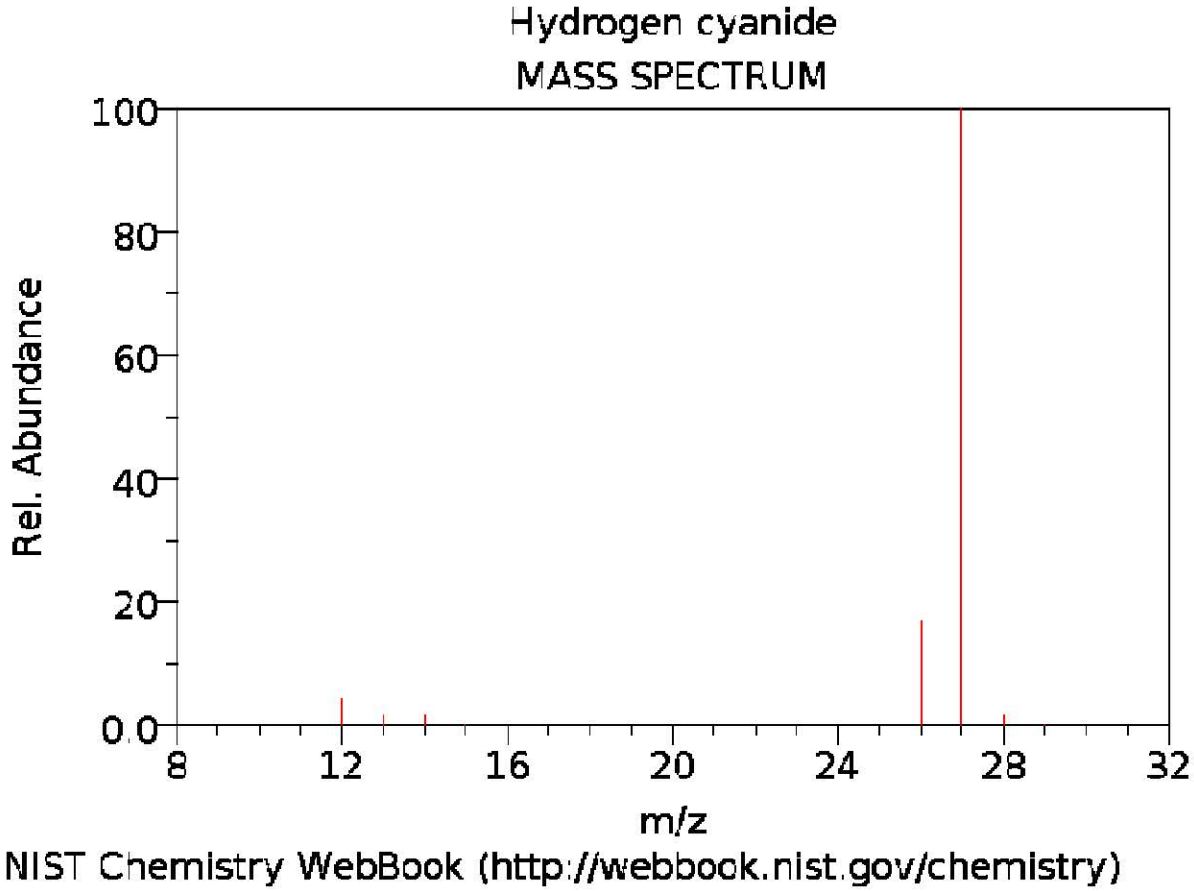
Remarks		

Infrared spectra:

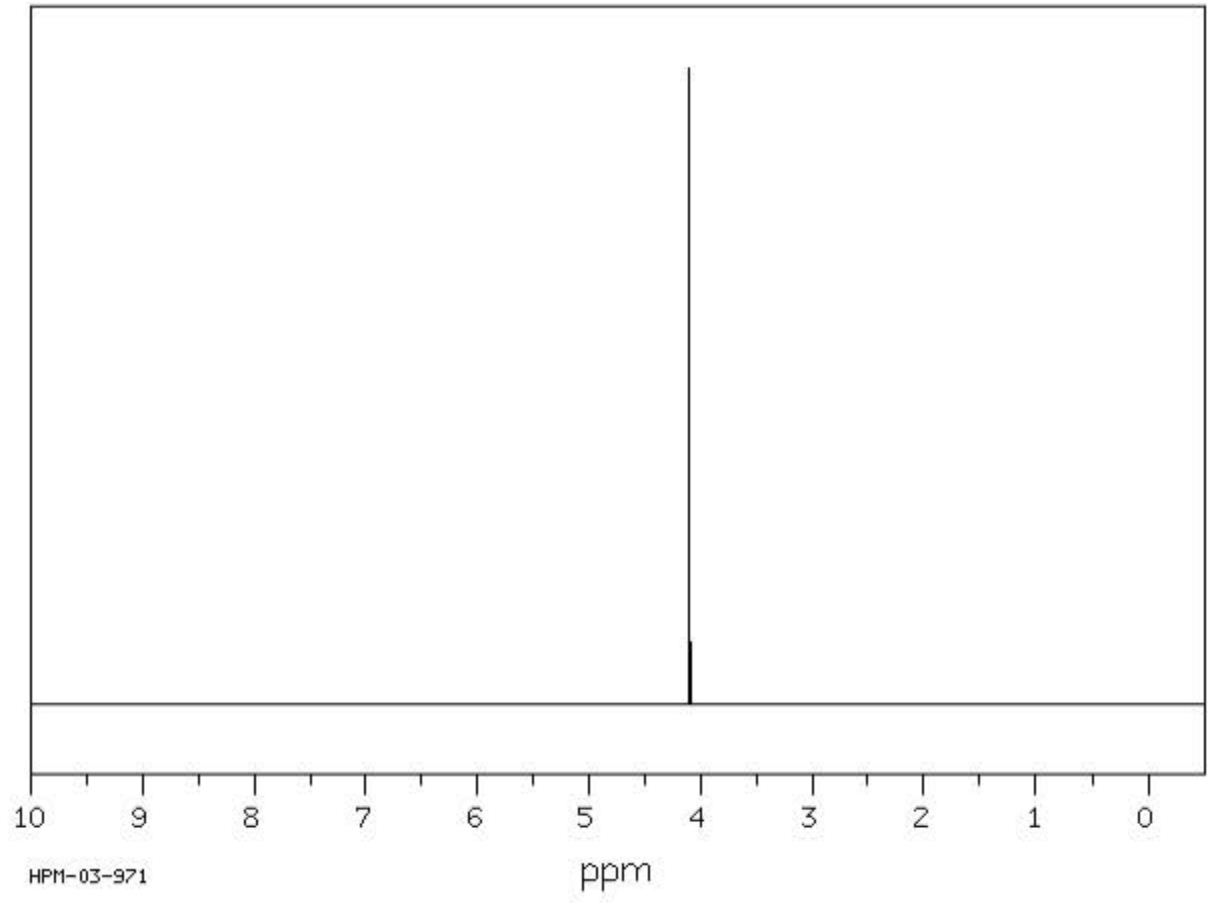



Hydrogen cyanide
MASS SPECTRUM
Rel. Abundance
100
80
60
40
20
0.0
8
12
16
20
24
28
32
m/z
NIST Chemistry WebBook (http://webbook.nist.gov/chemistry)

SDBS-^{1}H NMRSDBS No. 8592HPM-03-971
300 MHz

C H N neat

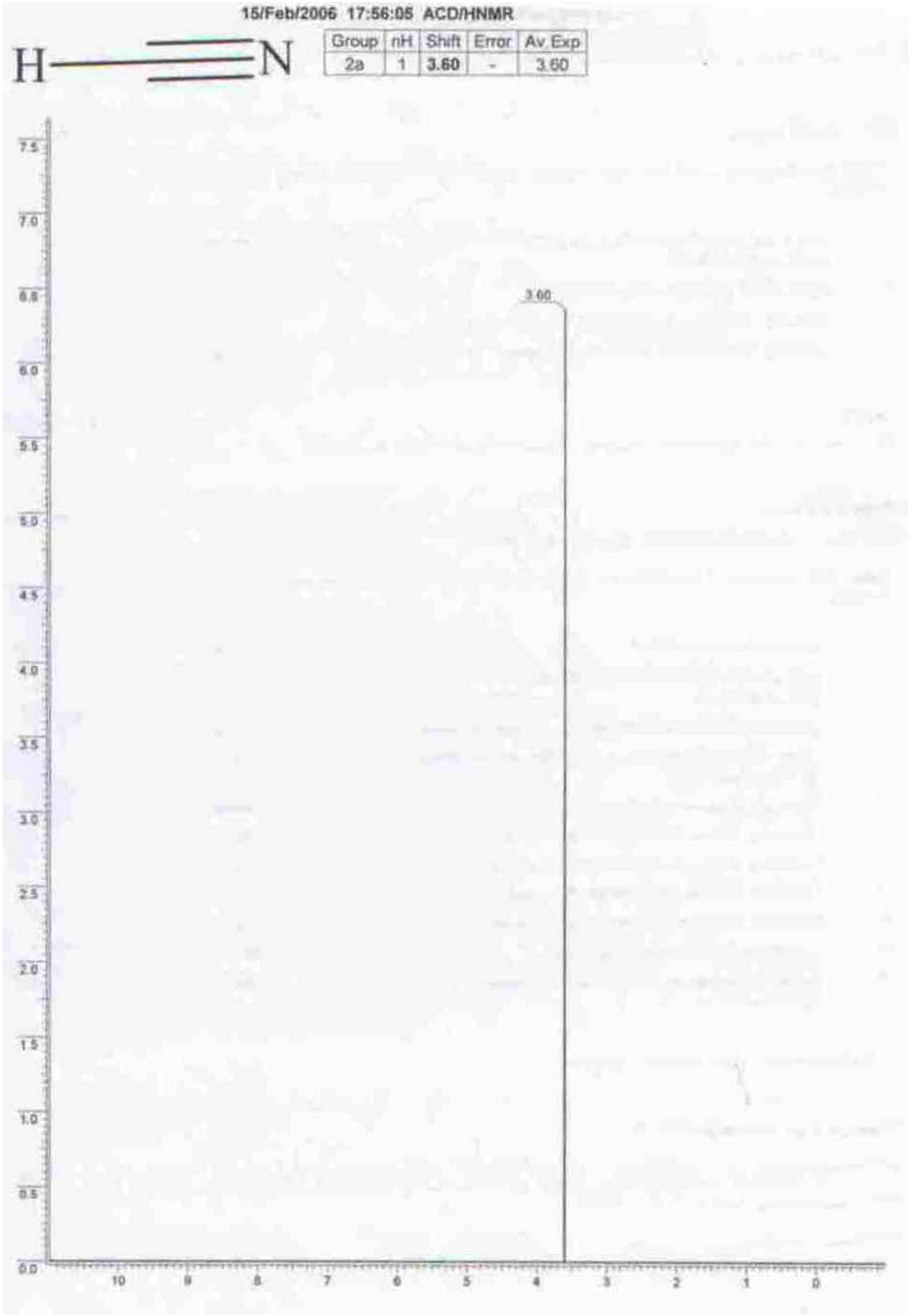
hydrogen cyanide



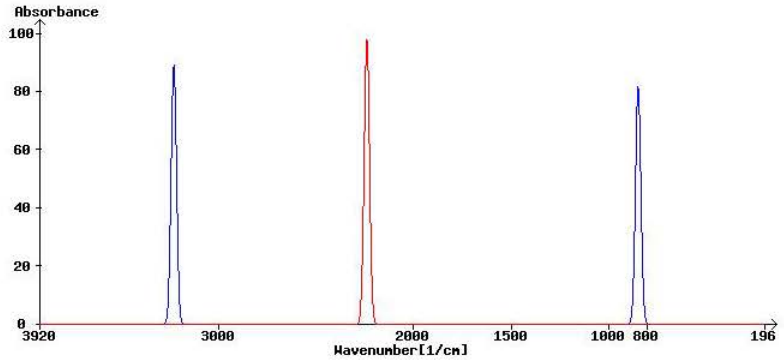
(A) H——C≡≡≡N

Parameter	ppm	Hz
D(A)	4.10	

1(BINSCH,G. & ROBERTS,J.D. J.PHYS.CHEM. 72, 4310 (1968)
J(A,N-15):8.7HZ. J(A,C-13)274HZ.


15/Feb/2006 17:56:05 ACD/HNMR
H
N
Group nH Shift Error Av Exp
2a 1 3.60 - 3.60
3.60
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
10
9
8
7
6
5
4
3
2
1
0

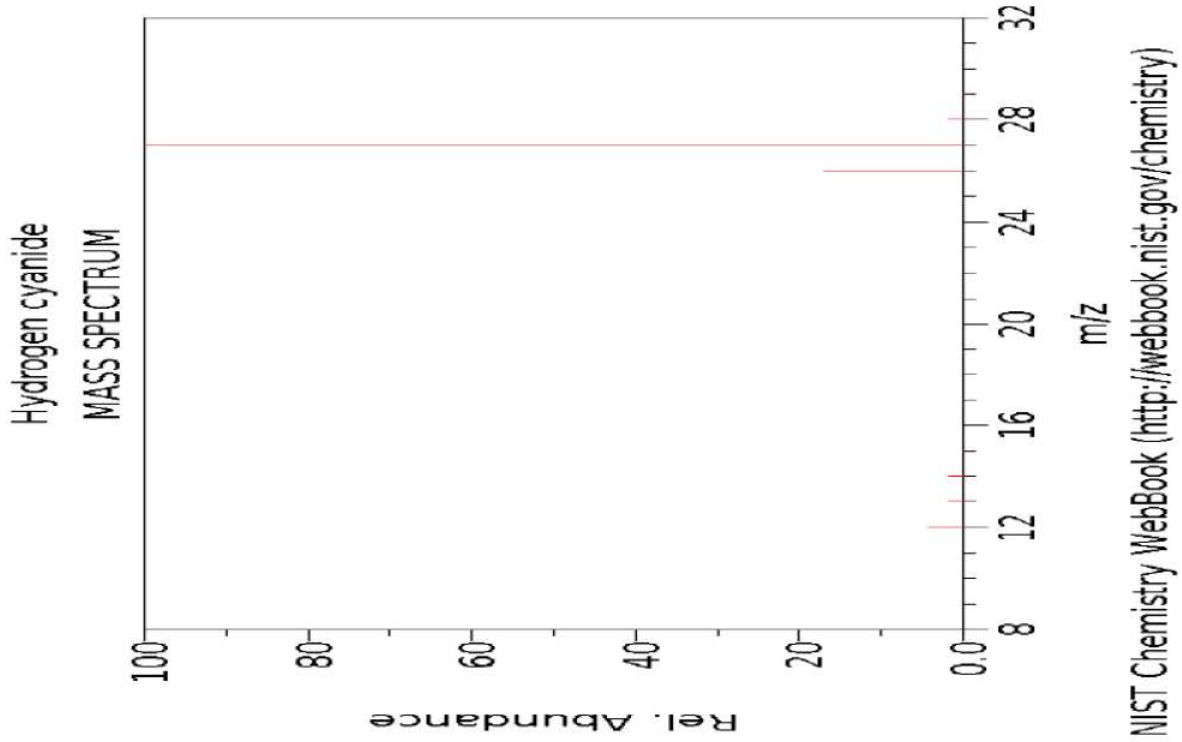
IR/Raman Spectra of CHN

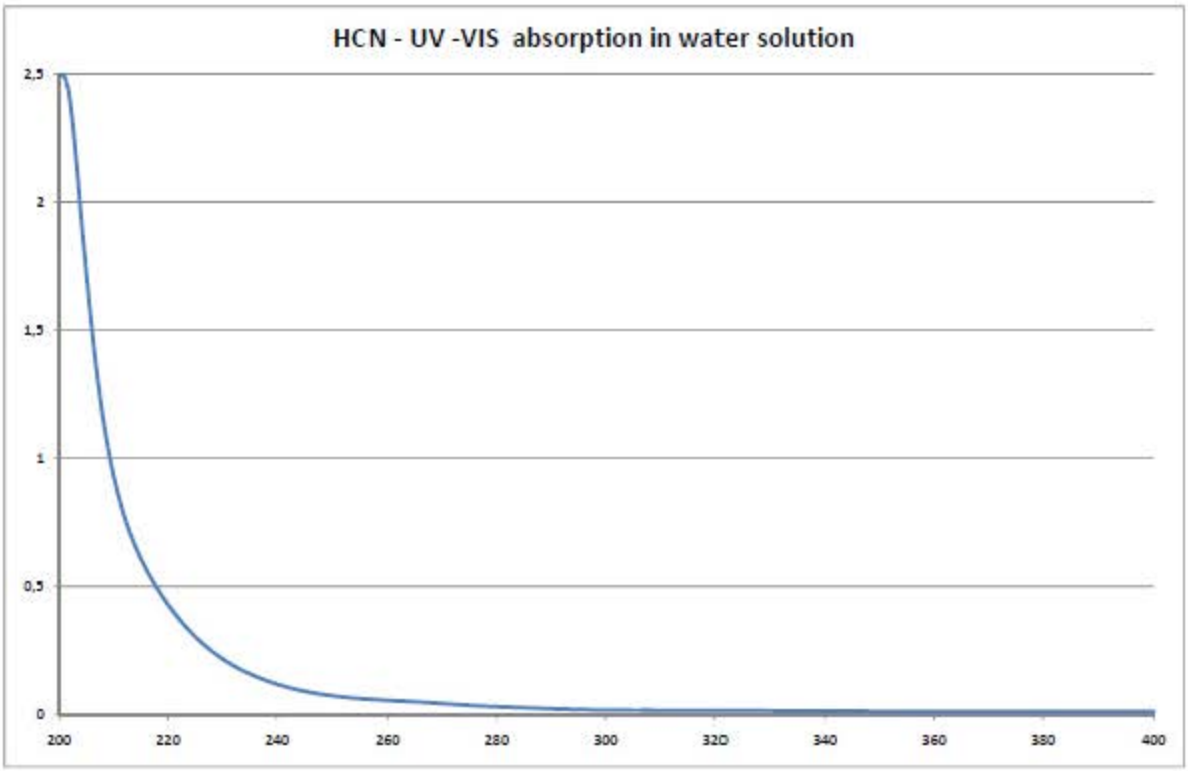


IR:	calculated (3557 data points)	Structure:	CHN	H-C≡N
Origin:	Vamp7.0	Method:	PM3	
Author:	WWW daemon apache	Date:	2006-02-14 12:35:07	
From:	3920.0 [1/cm]	To:	196.0 [1/cm]	
Xunit:	[1/cm]	Yunit:	Absorbance	

Normal Vibrations:
Click on the wave number to see corresponding 3D normal vibration

Peakname	[1/cm]	IR Intensity	Raman Intensity	Peakname	[1/cm]	IR Intensity	Raman Intensity
2 SI	3232.00	91.035	0.126	1 PI	848.25	41.647	0.000
1 SI	2240.42	100.000	100.000	1 PI	845.24	42.051	0.000





UV spektrum

Source: SHIMADZU UV-1602

Section A3.5 **Annex Point IIA III.3.5**	**Solubility in water**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Solubility in water: Fully miscible 1,000,000 mg/l at 25 °C **(2)** Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. Data From SRC PhysProp Database **(DOC IV_48)**	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.6 **Annex Point *IIIA III0§****	**Dissociation constant**	
** III0§* = additional data in TNsG on data requirements, but not contained in the BPD*		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Dissociation constant: pKa of 9.2 **(1,2)** Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature.	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. USEPA; Ambient Water Quality Criteria Doc: Cyanides p.C-7 (1980) EPA 440/5-80-037 **(DOC IV_69)** 2. Data From SRC PhysProp Database **(DOC IV_48)**	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.7 **Annex Point** *IIIA III.1*	**Solubility in organic solvents**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid, which is sorbed on surface of inert material. Boiling point of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Soluble in ethanol, ether. Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature. HCN isn't in contact with organic solutions either during manufacturing or during fumigation.	
Reference:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).**	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.8 **Annex Point** *IIIA III.2*	**Stability in organic solvents used in biocidal products and identity of relevant break down products**	
	JUSTIFICATION FOR NON-SUBMISSION OF DATA	Official use only
Other existing data [ ]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [x]**	
Detailed justification:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °C). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Hydrogen cyanide is both an active substance and biocidal product. There are no differencies in formula. Therefore there are no organic solvents used in the biocidal product.	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A3.9 **Annex Point IIA III.3.6**	**Partition coefficient n-octanol/water**	
		Official use only
Other existing data [x]	**Technically not feasible [ ]** **Scientifically unjustified [ ]**	
Limited exposure [ ]	**Other justification [ ]**	
Details:	Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only. Log Kow = -0.25 (20 °C / 68 °F) (**1**) Log Kow = +0.66 (0 °C / 32 °F) (**2,3)** Hydrogen cyanide is a substance whose physical and chemical properties have been known for a long time. The data used have been drawn from relevant literature.	
References:	Summaries and evaluations in this section are based mostly on exhaustive and reliably peer reviewed documents: **ATSDR** (2004, Toxicological profile of cyanide) **(DOC IV_1)** and **IPCS** (2004, WHO, CICAD 61: Hydrogen cyanide and cyanides: human health aspects). **(DOC IV_5)** and Hazardous Substance Data Bank (**HSDB**), National Library of Medicine´s TOXNET system (state in February 2006): Hydrogen cyanide *Peer reviewed* **(DOC IV_2).** Detailed justification: 1. Hansch, C., Leo, A., D. Hoekman. Exploring QSAR - Hydrophobic, Electronic, and Steric Constants. Washington, DC: American Chemical Society., 1995., p. 3 2. Data From SRC PhysProp Database (**DOC IV_48)** 3. JACC No 53, Cyanides of Hydrogen, Sodium and Potassium, and acetone Cyanohydrin (CAS No. 74-90-8, 143-33-9, 151-50-8 and 75-86-5), ECETOC JACC REPORT No. 53 European Centre for Ecotoxicology and Toxicology of Chemicals Volume I **(DOC IV_3)**	
Undertaking of intended data submission	No studies are planned.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

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

* Note: HCN is produced as liquid which is sorbed on surface of inert material. Boiling temperature of HCN in liquid state is 25.7 °C (78.3 °F). Due to the large surface of sorbed inert material, the evaporation is very fast. Therefore the active substance is gas only.

Section A3	Method	Purity of active substance tested	Result	GLP	Remarks / Justification	Reliability	Reference
3.1* **Melting point / solidification point (Annex Point IIA III.3.1)**	Not reported	Not reported	-13.4 °C / 7.9 °F	No		2 Valid with restrictions	DOC IIIA_3.1
3.1.1* **Boiling point (Annex Point IIA III.3.1)**	Not reported	Not reported	25.7 °C / 78.3 °F 25.6 °C / 78.1 °F	No		2 Valid with restrictions	DOC IIIA_3.1.1
3.1.2* **Bulk density / Relative density (Annex Point IIA III.3.1)**	Not reported	Not reported	Specific density: vapours 0.937 at 31 °C/ 87.8 °F Density 0.6884 g/cm^3 (liquid at 20 °C/68 °F) Density / Specific gravity 0.687 g/cm^3	No		2 Valid with restrictions	DOC IIIA_3.1.2
3.2* **Vapour pressure (Annex Point IIA III.3.2)**	Not reported	Not reported	84 kPa (at 20 °C / 68 °F) 35 kPa (at 0 °C / 32 °F)	No		2 Valid with restrictions	DOC IIIA_3.2
3.2.1* **Henry's constant (Annex Point IIA III.3.2)**	Not reported	Not reported	5.2 kPa. m^3. mol^{-1} 5.1 x 10^{-2} atm. m^3. mol^{-1}	No		2 Valid with restrictions	DOC IIIA_3.2.1
3.3.1* **Physical state (Annex Point IIA III.3.3)**	visual	Min. 97.6 % w/w	Gas – colourless Liquid – colourless	No		2 Valid with restrictions	DOC IIIA_3.3.1

Section A3	Method	Purity of active substance tested	Result	GLP	Remarks / Justification	Reliability	Reference
3.3.2* Colour (Annex Point IIA III.3.3)	visual	Min. 97.6 % w/w	colorless	No		2 Valid with restrictions)	DOC IIIA_3.3.2
3.3.3* Odour (Annex Point IIA III.3.3)	visual	Min. 97.6 % w/w	Smells of bitter almonds Olfactory threshold: 0.17 ppm (wt/vol.) in water 0.58 ppm (vol./vol.) in air	No		2 Valid with restrictions)	DOC IIIA_3.3.3
3.4 Active substance spectra (Annex Point IIA III.3.4)							
UV/VIS		Min. 97.6 % w/w	stated	No			DOC IIIA_3.4
IR		Min. 97.6 % w/w	stated	No			DOC IIIA_3.4
^{1}H-NMR		Min. 97.6 % w/w	stated	No			DOC IIIA_3.4
MS		Min. 97.6 % w/w	stated	No			DOC IIIA_3.4
3.5* Solubility in water (Annex Point IIA III.3.5)	Not reported	Not reported	Fully miscible 1,000,000 mg/L at 25 °C / 77 °F	No		2 Valid with restrictions	DOC IIIA_3.5
3.6* Dissociation constant (Annex Point IIIA III0§)	Not reported	Not reported	pKa of 9.2	No		2 Valid with restrictions	DOC IIIA_3.6

Section A3	Method	Purity of active substance tested	Result	GLP	Remarks / Justification	Reliability	Reference
3.7* **Solubility in organic solvents** **(Annex Point IIIA III.1)**	Not reported	Not reported	Soluble in ethanol, ether	No		2 Valid with restrictions	DOC IIIA_3.7
3.8* **Stability in organic solvents used in products** **(Annex Point IIIA III.2)**					Hydrogen cyanide is both an active substance and biocidal product. There are no differences in formula. Therefore there are no organic solvents used in the biocidal product either.		DOC IIIA_3.8
3.9* **Partition coefficient n-octanol / water** **(Annex Point IIA III.3.6)**	Not reported	Not reported	Log Kow = -0.25 at 20 °C/68 °F Log Kow = 0.66 at 0 °C/32 °F	No		2 Valid with restrictions	DOC IIIA_3.9
3.10* **Thermal Stability, identity of relevant breakdown products** **(Annex Point IIA III.3.7)**				No	No decomposition or sublimation occurs at the solidification or boiling temperature.		DOC IIIA_3.10

Section A3	Method	Purity of active substance tested	Result	GLP	Remarks / Justification	Reliability	Reference
3.11* Flammability (Annex Point IIA III.3.8)	Not reported	Not reported	Extremely flammable substance in the form of liquid. In the form of gas hydrogen cyanide forms explosive mixtures with air with these explosive limits: upper: 40 % vol. lower: 5.6 % vol. In alkali medium it may come under an autocatalytic polymerization reaction running in an explosion speed.			2 Valid with restrictions	DOC IIIA_3.11
3.11* Autoignition temperature (Annex Point IIA III.3.8)	Not reported	Not reported	538 °C / 1 000.4 °F	No		2 Valid with restrictions	DOC IIIA_3.11
3.12* Flash point (Annex Point IIA III.3.9)	Closed cup	Not reported	-17.8 °C / 0.04 °F -18 °C / 0.4 °F	No		2 Valid with restrictions	DOC IIIA_3.12
3.13* Surface tension (Annex Point IIA III.3.10)	Not reported	Not reported					DOC IIIA_3.13
3.14* Viscosity (Annex Point IIIA III0§)	Not reported	Not reported					DOC IIIA_3.14

Section A3	Method	Purity of active substance tested	Result	GLP	Remarks / Justification	Reliability	Reference
3.15* Explosive properties (Annex Point IIA III.311)	Not reported	Not reported	Active substance is readily flammable in contact with flame, sparks or at high temperature. It forms explosive mixtures with air. Not explosive within the meaning of regulations for classification of substances.	No		2 Valid with restrictions	DOC IIIA_3.15
3.16* Oxidizing properties (Annex Point IIA III.3.12)	Not reported	Not reported	Due to its chemical structure no oxidizing properties of hydrogen cyanide may be expected.	No		2 Valid with restrictions	DOC IIIA_3.16
3.17* Reactivity towards container material (Annex Point IIA III.3.13)		Hydrogen cyanide is packed into cans made from thick sheet iron (wall thickness 0.45 mm). Within more than 50 years of experience dry hydrogen cyanide has been not to react with this material.					DOC IIIA_3.17

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A4.1 **Annex Point IIA IV.4.1**	**ANALYTICAL METHODS FOR DETECTION AND IDENTIFICATION OF PRODUCT COMPONENTS**	
Details:	This section point is detailed in DOC III-A_4.1.1, 4.1.2, 4.1.3 a 4.1.4.	
Method of active substance determination	**Hydrogen cyanide** Densimetry with a densimeter with a measuring range 0.690–0.740 and 0.001 division, fitted with a thermometer with a range –30 to +30 °C and 2 °C division. The assessment of the hydrogen cyanide content is carried out through indirect argentometric titration with a silver nitrate volumetric solution. **For details and validation protocol, see DOC III-A_4.1.1**	
Methods of additives determination	**Sulphur dioxide** The assessment of the sulphur dioxide content is carried out through indirect iodometric titration with a $Na_2S_2O_3$ volumetric solution. **For details and validation protocol, see DOC III-A_4.1.2**	
	Phosphoric acid The assessment of the phosphoric acid content is carried out through titration with NaOH volumetric solution. **For details and validation protocol, see DOC III-A_4.1.3**	
Method of impurity determination	**Water** Water determination by Karl Fischer method. The principle of the test consists in reaction of any water present in a test portion with a solution of iodine and sulphur dioxide in a pyridine/methanol mixture (Karl Fischer reagent), previously standardized by titration with an exactly known mass of water. **For details see DOC III-A_4.1.4**	
Undertaking of intended data submission	No further studies are planned. Described methods are sufficiently robust and accurate for their intended uses.	

	Evaluation by Competent Authorities
Date	
Evaluation of applicant's justification	
Conclusion	
Remarks	

Section A4 **Annex Point IIA IV.**	**ANALYTICAL METHODS FOR DETECTION AND IDENTIFICATION OF PRODUCT COMPONENTS**	

Section A4.1 **Annex Point IIA IV.4.1**	**Determination of Hydrogen Cyanide Content**	
	1 REFERENCE	**Official use only**
1.1 Reference	Company standard PND 47-189-03	
1.2 Data protection	No	
1.2.1 Data owner	Lučební závody Draslovka, a. s. Kolín Havlíčkova 605 280 99 Kolín, Česká Republika	
1.2.2 Companies with letter of access	None	
1.2.3 Criteria for data protection	Not applicable	
	2 GUIDELINES AND QUALITY ASSURANCE	
2.1 Guideline study	Not applicable	
2.2 GLP	Not applicable	
2.3 Deviations	Not applicable	
	3 MATERIALS AND METHODS	
3.1 Preliminary treatment		
3.1.1 Enrichment	No enrichment involved in the method	
3.1.2 Clean-up	No clean-up involved in the method	
3.2 Detection		
3.2.1 Separation method	Determination of specific density with a densimeter Determination of hydrogen cyanide argentometrically	
3.2.2 Detector	Indirect argentometric titration with a silver nitrate volumetric solution	
3.2.3 Standard(s)	Potassium iodide	
3.2.4 Interfering substance(s)	Not applicable	
3.3 Linearity		
3.3.1 Calibration range	Not applicable	
3.3.2 Number of measurements	Not applicable	
3.3.3 Linearity	Not applicable	
3.4 Specifity: interfering substances	Not applicable	

3.5	**Recovery rates at different levels**	Not applicable	
3.5.1	Relative standard deviation	Not reported	
3.6	**Limit of determination**	Not applicable	
3.7	**Precision**		
3.7.1	Repeatability	Not reported	
3.7.2	Independent laboratory validation	See section 5	
		4 APPLICANT'S SUMMARY AND CONCLUSION	
4.1	**Materials and methods**	Densimeter with a measuring range 0.690–0.740 and 0.001 division, fitted with a thermometer with a range –30 to +30 °C and 2 °C division. The assessment of the hydrogen cyanide content is carried out through indirect argentometric titration with a silver nitrate volumetric solution. Chemicals: NaOH, 10% solution Silver nitrate, volumetric solution c = 0.1 mol/l Potassium iodide solution 1 % Method principle Titration of cyanide with nitrate in an alkaline medium leads first to dissolution of silver cyanide in NaCN excess. As soon as all cyanide ions are used for forming a complex anion, the first excessive drop of $AgNO_3$ will precipitate a silver cyanide precipitate. Test procedure: Put 40 ml of 10% NaOH to a 250ml ground-joint Erlenmeyer flask, close the flask with a greased plug and weigh with 0.1 mg accuracy. Dose with a syringe 3 ml HCN to the weighed flask and close it gastightly. Stir several times and let cool down for 5 minutes. Then lift up slightly the plug, close the flask again and weigh the quantity of non-pipetted HCN with 0.1 mg accuracy. After weighing flush the whole flask content quickly to a 500ml volumetric flask and add distilled water to the mark. Pipette 20 ml of this solution to a titration flask. After adding 40 ml distilled water and 1 ml 1% solution KI do titrate with 0.1 mol/l $AgNO_3$ solution to the first slight opacity. Calculation: The hydrogen cyanide content in % w (x) shall be calculated as follows: $$x = \frac{a \cdot f \cdot 5.406 \cdot 25 \cdot 100}{m}$$ Where a …… consumption of a silver nitrate volumetric solution c ($AgNO_3$) = 0.1 mol/l f…… factor of the silver nitrate volumetric solution	

	m… ..... HCN sample weight (mg) 5.406… .mg eqv. HCN (1 ml volumetric solution c ($AgNO_3$) = 0.1 mol/l shall titrate 5.406 mg HCN 25……..diluting factor (pipetted 20 ml from original 500 ml)	
4.2 Conclusion	Densimeter with a measuring range 0.690–0.740 and 0.001 division, fitted with a thermometer with a range –30 to +30 °C and 2 °C division. The assessment of the hydrogen cyanide content is carried out through indirect argentometric titration with a silver nitrate volumetric solution. The method is suitable for a standard chemical analytical laboratory. The procedure does not require any special equipment or chemicals.	
4.2.1 Reliability	*2*	
4.2.2 Deficiencies	*No*	
	5 VALIDATION SUBJECT	
	Method of argentometric determination of HCN content in Uragan D2. The required quality parameter is HCN content 97.6 ± 2.4 % wt.	
	6 METHOD DESCRIPTION	
	Argentometric determination of HCN – precipitation titration. The method is described in detail in a company standard PND 47-189-03.	
	7 MEASURED VALUES	
7.1 Method repeatability	The repeatability determination is performed on production samples from ten independent analyses in research department laboratories, using identical solutions and the same method described in the company standard PND 47-189-03. The analyses are performed by the same analytical chemist on the same day. Required value: coefficient of variation ***(v_x) < 0.5 %*** Where ***(v_x)*** is the coefficient of variation: $$v_x = \frac{s_x}{\overline{x}} \cdot 100\,[\%]$$ Arithmetic mean of the set may be calculated as: $$\overline{x} = \frac{1}{N}\sum_{i=1}^{N} x_i$$ Sample standard deviation of the data measured is calculated as: $$s = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \overline{x})^2}.$$	

7.2 Interlaboratory reproducibility of the results	**Results are summarised in Table 1.** The determination is performed on an identical sample on the same day in quality assurance laboratory. The analysis according to company standard PND 47-189-03 is performed by a different analytical chemist using different solutions.. On the basis of these results (using Student's t-test), reproducibility of the results was evaluated. Required value: coefficient of variation ***(v_x) < 0.5 %*** **Results are summarised in Table 2.**	
	8 CONCLUSION	
	Both sets of measured values meet the condition or repeatability (v_x < 0.5 %). Processed results also meet the interlaboratory reproducibility condition (result of Student's test $t < t_{crit}$). The method is suitable for a standard chemical analytical laboratory. The procedure does not require any special equipment or chemicals. **Results are summarised in Table 3.**	