



Verification Division  
S/1097/2013  
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ENGLISH only

**NOTE BY THE TECHNICAL SECRETARIAT**

**REPORT OF THE THIRTY-SEVENTH MEETING OF THE VALIDATION GROUP  
FOR THE UPDATING OF THE OPCW CENTRAL ANALYTICAL DATABASE  
12 AND 13 MARCH 2013**

1. The Validation Group (hereinafter “the Group”) met on 12 and 13 March 2013 to discuss the evaluation of new analytical data for possible inclusion in the OPCW Central Analytical Database (OCAD) and to consider matters related to it. Mr James Riches of the United Kingdom of Great Britain and Northern Ireland acted as Chairperson of the meeting.
2. The Group was informed of the sudden passing of Mr Mieczyslaw Sokolowski, who over several years contributed greatly to the Group's activities and the wider analytical chemistry community. A card was made available for those wishing to pass on their condolences to his family.
3. The Group welcomed Mr Josef Kosáta (Czech Republic) and Mr Ferdinand Visser (South Africa) as new members to the gas-chromatography (retention index) (GC(RI)) subgroup.
4. The Group accepted the resignation of Mr Lars-Gunnar Hammarström as Coordinator of the nuclear magnetic resonance spectrometry (NMR) subgroup, and thanked him for his excellent contribution over many meetings. A successor to the role of NMR subgroup Coordinator will be appointed as soon as possible.
5. Mr Damian Magiera, who is part of the NMR subgroup, was accepted by the Group as a member of the infrared (IR) subgroup.
6. The evaluators for the analytical techniques evaluated new data and sent their written reports to the coordinators for each analytical technique. The names of the coordinators who were present at the meeting, along with the technique for which each is responsible, are listed below:

(GC(RI))	Mr Martin Söderström (Finland)
Mass spectrometry (MS)	Mr Sten-Åke Fredriksson (Sweden)
Infrared spectroscopy (IR)	Mr Armando Alcaraz (United States of America)



These coordinators provided an evaluation summary to the Group for discussion at the meeting. The evaluators finalised the evaluation of the analytical data and confirmed that the data approved is technically valid.

7. This report of the Group's Thirty-Seventh Meeting presents the sets of validated analytical data of scheduled chemicals (see Annex 1) that are to be forwarded to the Director-General for appropriate action.
8. The Technical Secretariat (hereinafter "the Secretariat") informed the Group that the data on scheduled chemicals validated by the Group at its previous meeting had been approved by the Executive Council (hereinafter "the Council") at its Seventy-First Session (EC-71/DEC.6, dated 20 February 2013). Based on the Group's Thirty-Fifth Report, predicted GC(RI) data, now with measured data available, were approved for removal by the Council in future releases of the OCAD (EC-71/DEC.7, dated 20 February 2013).
9. The Group was informed that a new version of the OCAD (v15\_2012) had been officially released in December 2012, as had a new version of the Validation Group Working Database (VGWD\_2012, in January 2013).
10. The Group discussed the submission of MS-MS (tandem-mass spectrometry) data. A set of LC (liquid chromatograph)-MS-MS data was submitted by Mr James Riches for consideration by the MS subgroup. It was agreed that a system for collating the data would be considered by the MS subgroup before the Group's next meeting.
11. Current MS data submission practice applies a low-intensity ion cut-off ( $\leq 0.5\%$ ) to MS data. The Group discussed the experiences of the MS subgroup members who, following a decision at the Group's Thirty-Sixth Meeting, had agreed to evaluate the MS data on a trial basis with a low-intensity 0.1% cut-off applied. Following related discussions on data pre-processing, laboratories submitting data are encouraged to provide details of any pre-processing of their data. The data submission guidelines (S/969/2011, dated 2 November 2011) will be updated to clarify how the data should be submitted.
12. Uncertainty values for GC(RI) submitted by some laboratories do not represent the true uncertainty of the measurement. The data submission guidelines (S/969/2011) will be updated to clarify how the data should be submitted.
13. The naming of two scheduled chemicals containing deuterium atoms was discussed by the Group. A naming protocol was agreed and the "Protocol for Naming Compounds in the OPCW Central Analytical Database" will be updated accordingly.
14. The Group discussed the non-scheduled chemicals O-Propyl methylphosphonothiocyanidate and O-Ethylmethylphosphonothiocyanidate, data for which had been submitted to the Group. It was agreed that data for these chemicals should be included in the VGWD, when it is validated.
15. The Group agreed that data measured for a chemical, accepted by one subgroup, but not by one or more other subgroups, calls into question the identification of the chemical. The Group's decision on this data shall be postponed for further clarification.

16. Approximately 150 MS and GC(RI) data are available for the next meeting. Available data from all analytical techniques will be sent to the Group at least six weeks before the next scheduled Group meeting.
17. The next meeting is scheduled to take place on 24 and 25 September 2013. The evaluators agreed to send their written evaluation reports to the appointed coordinators no later than 10 September 2013. The evaluators have agreed to come to the meeting prepared to finalise the evaluation of the analytical data referred to in the previous paragraph.
18. The Group noted that Ms Pingfeng Liu will have completed her tenure at the OPCW and will no longer be coordinating the work of the Group at the next meeting. Ms Liu was recognised by the Group for her outstanding organisation skills and attention to detail.
19. Annex 2 to this report lists the evaluators.

Annexes:

- Annex 1: Lists of Approved Data Recommended for Inclusion in the OPCW Central Analytical Database
- Annex 2: List of Members of the Validation Group

## Annex 1

**LISTS OF APPROVED DATA RECOMMENDED FOR INCLUSION  
IN THE OPCW CENTRAL ANALYTICAL DATABASE**

Note: In the last column of the tables that follow, "A" means "accepted"; "B", "accepted subject to minor corrections".

**TABLE 1: LIST OF APPROVED MS DATA OF SCHEDULED CHEMICALS**

<b>OPCW Code</b>	<b>Chemical Name</b>	<b>Schedule</b>	<b>Decision</b>
07-2-3249ar	sec-Butyl 2-dimethylaminoethyl ethylphosphonate	2.B.04	A
07-2-3265	Methyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3266	Methyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3267	Methyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3268	Methyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3269	Ethyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3270	Ethyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3271	Ethyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3272	Ethyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3273	Propyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3274	Propyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3275	Propyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3276	Propyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3277	Isopropyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3278	Isopropyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3279	Isopropyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3280	Isopropyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3281	Butyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3282	Butyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3283	Butyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3284	Butyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3285a	sec-Butyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3285b	sec-Butyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3286a	sec-Butyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3286b	sec-Butyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3287a	sec-Butyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3287b	sec-Butyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3288a	sec-Butyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3288b	sec-Butyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3289	Isobutyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3290	Isobutyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3291	Isobutyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3292	Isobutyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3293	Cyclohexyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3294	Cyclohexyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3295	Cyclohexyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3296	Cyclohexyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3297a	Pinacolyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A

OPCW Code	Chemical Name	Schedule	Decision
07-2-3297b	Pinacolyl 2-dimethylaminoethyl propylphosphonate	2.B.04	A
07-2-3298a	Pinacolyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3298b	Pinacolyl 2-diethylaminoethyl propylphosphonate	2.B.04	A
07-2-3299a	Pinacolyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3299b	Pinacolyl 2-dipropylaminoethyl propylphosphonate	2.B.04	A
07-2-3300a	Pinacolyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3300b	Pinacolyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	A
07-2-3301	Methyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3302	Methyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3303	Methyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3304	Methyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3305	Ethyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3306	Ethyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3307	Ethyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3308	Ethyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3309	Propyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3310	Propyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3311	Propyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3312	Propyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3313	Isopropyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3314	Isopropyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3315	Isopropyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3316	Isopropyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3317	Butyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3318	Butyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3319	Butyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3321a	sec-Butyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3321b	sec-Butyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3322a	sec-Butyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3322b	sec-Butyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3323a	sec-Butyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3323b	sec-Butyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3324a	sec-Butyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3324b	sec-Butyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3325	Isobutyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3326	Isobutyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3327	Isobutyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3328	Isobutyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3329	Cyclohexyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3330	Cyclohexyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3331	Cyclohexyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3332	Cyclohexyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3333a	Pinacolyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3333b	Pinacolyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3334a	Pinacolyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3334b	Pinacolyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3335a	Pinacolyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A

OPCW Code	Chemical Name	Schedule	Decision
07-2-3335b	Pinacolyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3336a	Pinacolyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
07-2-3336b	Pinacolyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	A
28-2-0037	N,N-Dimethyl-P-methylphosphonamidic chloride	2.B.04	A
28-2-0038	Methyl-d <sub>3</sub> N,N-dimethyl-P-methylphosphonamidate	2.B.04	B
28-2-0040	Ethyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	A
28-2-0041	Propyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	A
28-2-0042	Isopropyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	A
28-2-0044	Pentyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	A
28-2-0045	Hexyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	A
28-2-0046	Heptyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	A
28-2-0047	sec-Butyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	A
28-2-0048	1-Methylbutyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	A
28-2-0049	2-Methylbutyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	B
28-2-0051	S-Ethyl N,N-dimethyl-P-methylphosphonamidithiolate	2.B.04	A
28-2-0052	S-Propyl N,N-dimethyl-P-methylphosphonamidithiolate	2.B.04	A
28-2-0053	S-Butyl N,N-dimethyl-P-methylphosphonamidithiolate	2.B.04	A
28-2-0054	S-Pentyl N,N-dimethyl-P-methylphosphonamidithiolate	2.B.04	A
28-2-0055	N,N-Dimethyl-P-ethylphosphonamidic chloride	2.B.04	A
28-2-0056	Methyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	A
28-2-0057	Methyl-d <sub>3</sub> N,N-dimethyl-P-ethylphosphonamidate	2.B.04	B
28-2-0058	Ethyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	A
28-2-0059	Propyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	A
28-2-0060	Isopropyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	A
28-2-0061	Butyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	A
28-2-0062	Pentyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	A
28-2-0063	Hexyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	A
28-2-0064	Heptyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	A
28-2-0065	S-Ethyl N,N-dimethyl-P-ethylphosphonamidithiolate	2.B.04	A
28-2-0066	S-Propyl N,N-dimethyl-P-ethylphosphonamidithiolate	2.B.04	A
28-2-0067	S-Butyl N,N-dimethyl-P-ethylphosphonamidithiolate	2.B.04	A
28-2-0068	S-Pentyl N,N-dimethyl-P-ethylphosphonamidithiolate	2.B.04	B
28-2-0069	N,N-Dimethyl-P-propylphosphonamidic chloride	2.B.04	A
28-2-0070	Methyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	A
28-2-0071	Ethyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	A
28-2-0072	Propyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	A
28-2-0073	Butyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	A
28-2-0074	Pentyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	A
28-2-0075	S-Ethyl N,N-dimethyl-P-propylphosphonamidithiolate	2.B.04	A
28-2-0076	S-Propyl N,N-dimethyl-P-propylphosphonamidithiolate	2.B.04	A
28-2-0077	S-Butyl N,N-dimethyl-P-propylphosphonamidithiolate	2.B.04	A
28-2-0078	N,N,N',N'-Tetramethyl-P-methylphosphonic diamide	2.B.04	A
28-2-0079	N,N,N',N'-Tetramethyl-P-ethylphosphonic diamide	2.B.04	A
28-2-0080	N,N,N',N'-Tetramethyl-P-propylphosphonic diamide	2.B.04	A
28-2-0081a	N,N,N',N'-Tetramethyl-P,P'-dimethylpyrophosphonic diamide	2.B.04	B

<b>OPCW Code</b>	<b>Chemical Name</b>	<b>Schedule</b>	<b>Decision</b>
28-2-0081b	N,N,N',N'-Tetramethyl-P,P'-dimethylpyrophosphonic diamide	2.B.04	B
28-2-0083b	N,N,N',N'-Tetramethyl-P,P'-dipropylpyrophosphonic diamide	2.B.04	B
28-2-0085	O'-Butyl N,N-dimethyl-P,P'-dimethyldiphosphono-P-amidate	2.B.04	A
28-2-0086	O'-2-Methylbutyl N,N-dimethyl-P,P'-dimethyldiphosphono-P-amidate	2.B.04	B
28-2-0087	O'-Butyl N,N-dimethyl-P,P'-diethyldiphosphono-P-amidate	2.B.04	A
28-2-0088	2-Methylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0089	3-Methylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0090	1-Ethylpropyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0091a	1,2-Dimethylpropyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0091b	1,2-Dimethylpropyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0092	2,2-Dimethylpropyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0093	3-Methylpentyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0094	2-Ethylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0095	4-Methylpentyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0096a	1,2-Dimethylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0096b	1,2-Dimethylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0096d	1,2-Dimethylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
28-2-0097	1-Ethylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	A
29-2-0007br	Methyl 1-methylbut-2-enyl methylphosphonate	2.B.04	A

**TABLE 2: LIST OF APPROVED GC(RI) DATA**

Note: A "1" under the "Column" heading of GC(RI) data means an HP5 or an SE54 column and a "2" means a DB-5MS column.

OPCW Code	Chemical Name	Schedule	Column	RI(a)	RI(b)	RI(c)	RI(d)	Decision
07-4-3028	Methyl 2-dimethylaminoethyl propylphosphonate	2.B.04	2	1373				A
07-4-3029	Methyl 2-diethylaminoethyl propylphosphonate	2.B.04	2	1526				A
07-4-3030	Methyl 2-dipropylaminoethyl propylphosphonate	2.B.04	2	1675				A
07-4-3031	Methyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	2	1652				A
07-4-3032	Ethyl 2-dimethylaminoethyl propylphosphonate	2.B.04	2	1425				A
07-4-3033	Ethyl 2-diethylaminoethyl propylphosphonate	2.B.04	2	1575				A
07-4-3034	Ethyl 2-dipropylaminoethyl propylphosphonate	2.B.04	2	1721				A
07-4-3035	Ethyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	2	1697				A
07-4-3036	Propyl 2-dimethylaminoethyl propylphosphonate	2.B.04	2	1511				A
07-4-3037	Propyl 2-diethylaminoethyl propylphosphonate	2.B.04	2	1659				A
07-4-3038	Propyl 2-dipropylaminoethyl propylphosphonate	2.B.04	2	1803				A
07-4-3039	Propyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	2	1781				A
07-4-3040	Isopropyl 2-dimethylaminoethyl propylphosphonate	2.B.04	2	1442				A
07-4-3041	Isopropyl 2-diethylaminoethyl propylphosphonate	2.B.04	2	1591				A
07-4-3042	Isopropyl 2-dipropylaminoethyl propylphosphonate	2.B.04	2	1736				A
07-4-3043	Isopropyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	2	1712				A
07-4-3044	Butyl 2-dimethylaminoethyl propylphosphonate	2.B.04	2	1601				A
07-4-3045	Butyl 2-diethylaminoethyl propylphosphonate	2.B.04	2	1748				A
07-4-3046	Butyl 2-dipropylaminoethyl propylphosphonate	2.B.04	2	1890				A
07-4-3047	Butyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	2	1868				A
07-4-3048	sec-Butyl 2-dimethylaminoethyl propylphosphonate	2.B.04	2	1529	1535			A
07-4-3049	sec-Butyl 2-diethylaminoethyl propylphosphonate	2.B.04	2	1678	1684			A
07-4-3050	sec-Butyl 2-dipropylaminoethyl propylphosphonate	2.B.04	2	1821	1827			A
07-4-3051	sec-Butyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	2	1796	1804			A
07-4-3052	Isobutyl 2-dimethylaminoethyl propylphosphonate	2.B.04	2	1557				A
07-4-3053	Isobutyl 2-diethylaminoethyl propylphosphonate	2.B.04	2	1703				A
07-4-3054	Isobutyl 2-dipropylaminoethyl propylphosphonate	2.B.04	2	1846				A
07-4-3055	Isobutyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	2	1824				A
07-4-3056	Cyclohexyl 2-dimethylaminoethyl propylphosphonate	2.B.04	2	1842				A
07-4-3057	Cyclohexyl 2-diethylaminoethyl propylphosphonate	2.B.04	2	1991				A
07-4-3058	Cyclohexyl 2-dipropylaminoethyl propylphosphonate	2.B.04	2	2137				A



OPCW Code	Chemical Name	Schedule	Column	RI(a)	RI(b)	RI(c)	RI(d)	Decision
07-4-3059	Cyclohexyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	2	2114				A
07-4-3060	Pinacolyl 2-dimethylaminoethyl propylphosphonate	2.B.04	2	1637	1651			A
07-4-3061	Pinacolyl 2-diethylaminoethyl propylphosphonate	2.B.04	2	1787	1800			A
07-4-3062	Pinacolyl 2-dipropylaminoethyl propylphosphonate	2.B.04	2	1929	1943			A
07-4-3063	Pinacolyl 2-diisopropylaminoethyl propylphosphonate	2.B.04	2	1902	1919			A
07-4-3064	Methyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	2	1330				A
07-4-3065	Methyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	2	1483				A
07-4-3066	Methyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	2	1633				A
07-4-3067	Methyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	2	1607				A
07-4-3068	Ethyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	2	1381				A
07-4-3069	Ethyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	2	1532				A
07-4-3070	Ethyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	2	1679				A
07-4-3071	Ethyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	2	1654				A
07-4-3072	Propyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	2	1468				A
07-4-3073	Propyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	2	1617				A
07-4-3074	Propyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	2	1762				A
07-4-3075	Propyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	2	1737				A
07-4-3076	Isopropyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	2	1399				A
07-4-3077	Isopropyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	2	1550				A
07-4-3078	Isopropyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	2	1695				A
07-4-3079	Isopropyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	2	1670				A
07-4-3080	Butyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	2	1557				A
07-4-3081	Butyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	2	1704				A
07-4-3082	Butyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	2	1848				A
07-4-3083	Butyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	2	1823				A
07-4-3084	sec-Butyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	2	1487	1495			A
07-4-3085	sec-Butyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	2	1637	1645			A
07-4-3086	sec-Butyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	2	1781	1790			A
07-4-3087	sec-Butyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	2	1754	1764			A
07-4-3088	Isobutyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	2	1514				A
07-4-3089	Isobutyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	2	1662				A
07-4-3090	Isobutyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	2	1805				A
07-4-3091	Isobutyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	2	1779				A
07-4-3092	Cyclohexyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	2	1795				A

OPCW Code	Chemical Name	Schedule	Column	RI(a)	RI(b)	RI(c)	RI(d)	Decision
07-4-3093	Cyclohexyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	2	1947				A
07-4-3094	Cyclohexyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	2	2093				A
07-4-3095	Cyclohexyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	2	2068				A
07-4-3096	Pinacolyl 2-dimethylaminoethyl isopropylphosphonate	2.B.04	2	1595	1613			A
07-4-3097	Pinacolyl 2-diethylaminoethyl isopropylphosphonate	2.B.04	2	1749	1766			A
07-4-3098	Pinacolyl 2-dipropylaminoethyl isopropylphosphonate	2.B.04	2	1892	1910			A
07-4-3099	Pinacolyl 2-diisopropylaminoethyl isopropylphosphonate	2.B.04	2	1862	1883			A
28-4-0040	N,N-Dimethyl-P-methylphosphonamidic chloride	2.B.04	1	1096				A
28-4-0041	Methyl-d3 N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1024				B
28-4-0043	Ethyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1096				A
28-4-0044	Propyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1175				A
28-4-0045	Isopropyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1120				A
28-4-0047	Pentyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1366				A
28-4-0048	Hexyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1469				A
28-4-0049	Heptyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1569				A
28-4-0050	sec-Butyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1205				A
28-4-0051	1-Methylbutyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1288				A
28-4-0052	2-Methylbutyl N,N-dimethyl-P-methylphosphonamidate	2.B.04	1	1327				A
28-4-0054	S-Ethyl N,N-dimethyl-P-methylphosphonamidodithiolate	2.B.04	1	1291				A
28-4-0055	S-Propyl N,N-dimethyl-P-methylphosphonamidodithiolate	2.B.04	1	1377				A
28-4-0056	S-Butyl N,N-dimethyl-P-methylphosphonamidodithiolate	2.B.04	1	1479				A
28-4-0057	S-Pentyl N,N-dimethyl-P-methylphosphonamidodithiolate	2.B.04	1	1583				A
28-4-0058	N,N-Dimethyl-P-ethylphosphonamidic chloride	2.B.04	1	1165				A
28-4-0059	Methyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	1	1118				A
28-4-0060	Methyl-d3 N,N-dimethyl-P-ethylphosphonamidate	2.B.04	1	1106				B
28-4-0061	Ethyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	1	1159				B
28-4-0062	Propyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	1	1246				B
28-4-0063	Isopropyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	1	1186				B
28-4-0064	Butyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	1	1338				B
28-4-0065	Pentyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	1	1440				B
28-4-0066	Hexyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	1	1540				B
28-4-0067	Heptyl N,N-dimethyl-P-ethylphosphonamidate	2.B.04	1	1641				B
28-4-0068	S-Ethyl N,N-dimethyl-P-ethylphosphonamidodithiolate	2.B.04	1	1360				A
28-4-0069	S-Propyl N,N-dimethyl-P-ethylphosphonamidodithiolate	2.B.04	1	1443				A

OPCW Code	Chemical Name	Schedule	Column	RI(a)	RI(b)	RI(c)	RI(d)	Decision
28-4-0070	S-Butyl N,N-dimethyl-P-ethylphosphonamidodithiolate	2.B.04	1	1548				A
28-4-0071	S-Pentyl N,N-dimethyl-P-ethylphosphonamidodithiolate	2.B.04	1	1642				A
28-4-0072	N,N-Dimethyl-P-propylphosphonamidic chloride	2.B.04	1	1243				A
28-4-0073	Methyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	1	1185				A
28-4-0074	Ethyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	1	1237				A
28-4-0075	Propyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	1	1328				A
28-4-0076	Butyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	1	1414				A
28-4-0077	Pentyl N,N-dimethyl-P-propylphosphonamidate	2.B.04	1	1514				A
28-4-0078	S-Ethyl N,N-dimethyl-P-propylphosphonamidodithiolate	2.B.04	1	1431				A
28-4-0079	S-Propyl N,N-dimethyl-P-propylphosphonamidodithiolate	2.B.04	1	1520				A
28-4-0080	S-Butyl N,N-dimethyl-P-propylphosphonamidodithiolate	2.B.04	1	1618				A
28-4-0081	N,N,N',N'-Tetramethyl-P-methylphosphonic diamide	2.B.04	1	1205				A
28-4-0082	N,N,N',N'-Tetramethyl-P-ethylphosphonic diamide	2.B.04	1	1277				A
28-4-0083	N,N,N',N'-Tetramethyl-P-propylphosphonic diamide	2.B.04	1	1356				A
28-4-0084	N,N,N',N'-Tetramethyl-P,P'-dimethylpyrophosphonic diamide	2.B.04	1	1535	1551			B
28-4-0086	N,N,N',N'-Tetramethyl-P,P'-dipropylpyrophosphonic diamide	2.B.04	1	1803	1822			B
28-4-0088	O'-Butyl N,N-dimethyl-P,P'-dimethylidiphosphono-P-amidate	2.B.04	1	1675				A
28-4-0089	O'-2-Methylbutyl N,N-dimethyl-P,P'-dimethylidiphosphono-P-amidate	2.B.04	1	1729				B
28-4-0090	O'-Butyl N,N-dimethyl-P,P'-diethylidiphosphono-P-amidate	2.B.04	1	1800				B
28-4-0091	2-Methylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1369				A
28-4-0092	3-Methylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1366				A
28-4-0093	1-Ethylpropyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1344				A
28-4-0094	1,2-Dimethylpropyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1324	1331			A
28-4-0095	2,2-Dimethylpropyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1300				A
28-4-0096	3-Methylpentyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1475				A
28-4-0097	2-Ethylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1459				A
28-4-0098	4-Methylpentyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1475				A
28-4-0099	1,2-Dimethylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1407	1414	1418	1421	A
28-4-0100	1-Ethylbutyl N,N-dimethylphosphoramidocyanidate	1.A.02	1	1415				A

## Annex 2

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