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MIL-STD-1222
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MILITARY STANDARD

INORGANIC SALTS AND COMPOUNDS, ANALYZED REAGENT AND REAGENT GRADE

FSC 6810

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DEPARTMENT OF DEFENSE
Washington, D.C. 20301

Inorganic Salts and Compounds, Analyzed Reagent and Reagent Grade

MIL-STD-1222

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FOREWORD

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CONTENTS

			Page
Paragraph	1	SCOPE	1
	1.1	Coverage	1
	1.2	Application	3
	2	REFERENCED DOCUMENTS	3
	3	GLOSSARY	5
	3.1	Definitions	5
	3.2	Abbreviations	6
	4	GENERAL REQUIREMENTS	7
	4.1	Chemical and physical requirements	7
	4.2	Nomenclature	7
	4.3	Packaging data and labeling	7
	4.4	Safety	7
	4.5	Shelf life	8
	4.6	Solubility data	8
	4.7	Temperature	8
	4.8	Substitutability and interchangeability	8
	5	DETAIL REQUIREMENTS	8
	5.1	Aluminum nitrate, nonahydrate, analyzed reagent	8
	5.1.1	Specifications	8
	5.1.2	Technical description	8
	5.1.3	Use data	9
	5.1.4	Packaging data and labeling	9
	5.1.5	Storage data	9
	5.2	Aluminum oxide, anhydrous, analyzed reagent	9
	5.2.1	Specifications	9
	5.2.2	Technical description	9
	5.2.3	Use data	10
	5.2.4	Packaging data and labeling	10
	5.2.5	Storage data	10
	5.3	Antimony trichloride, analyzed reagent	10
	5.3.1	Specifications	10
	5.3.2	Technical description	10
	5.3.3	Use data	11
	5.3.4	Packaging data and labeling	11
	5.3.5	Storage data	11
	5.4	Antimony trioxide, analyzed reagent	11
	5.4.1	Specifications	11
	5.4.2	Technical description	12
	5.4.3	Use data	12
	5.4.4	Packaging data and labeling	12
	5.4.5	Storage data	12
	5.5	Arsenic trichloride, analyzed reagent	12
	5.5.1	Specifications	13
	5.5.2	Technical description	13
	5.5.3	Use data	13
	5.5.4	Packaging data and labeling	13
	5.5.5	Storage data	13

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Page

Paragraph	5.6	Barium dioxide, anhydrous, analyzed reagent	13
	5.6.1	Specifications	14
	5.6.2	Technical description	14
	5.6.3	Use data	14
	5.6.4	Packaging data and labeling	14
	5.6.5	Storage data	15
	5.7	Barium perchlorate, anhydrous, analyzed reagent	15
	5.7.1	Specifications	15
	5.7.2	Technical description	15
	5.7.3	Use data	15
	5.7.4	Packaging data and labeling	15
	5.7.5	Storage data	16
	5.8	Bismuth nitrate, pentahydrate, analyzed reagent	16
	5.8.1	Specifications	16
	5.8.2	Technical description	16
	5.8.3	Use data	16
	5.8.4	Packaging data and labeling	16
	5.8.5	Storage data	17
	5.9	Bismuth oxyiodide, reagent	17
	5.9.1	Specifications	17
	5.9.2	Technical description	17
	5.9.3	Use data	17
	5.9.4	Packaging data and labeling	17
	5.9.5	Storage data	17
	5.10	Cadmium nitrate, tetrahydrate, analyzed reagent	18
	5.10.1	Specifications	18
	5.10.2	Technical description	18
	5.10.3	Use data	18
	5.10.4	Packaging data and labeling	18
	5.10.5	Storage data	19
	5.11	Calcium fluoride, analyzed reagent	19
	5.11.1	Specifications	19
	5.11.2	Technical description	19
	5.11.3	Use data	19
	5.11.4	Packaging data and labeling	19
	5.11.5	Storage data	20
	5.12	Calcium nitrate, tetrahydrate, analyzed reagent	20
	5.12.1	Specifications	20
	5.12.2	Technical description	20
	5.12.3	Use data	20
	5.12.4	Packaging data and labeling	20
	5.12.5	Storage data	21

Downloaded from http://www.everyspec.com

		Page
Paragraph 5.13	Ceric sulfate, anhydrous, analyzed reagent	21
5.13.1	Specifications	21
5.13.2	Technical description	21
5.13.3	Use data	21
5.13.4	Packaging data and labeling	21
5.13.5	Storage data	22
5.14	Chromic chloride, hexahydrate, analyzed reagent	22
5.14.1	Specifications	22
5.14.2	Technical description	22
5.14.3	Use data	22
5.14.4	Packaging data and labeling	22
5.14.5	Storage data	23
5.15	Chromic nitrate, nonahydrate, analyzed reagent	23
5.15.1	Specifications	23
5.15.2	Technical description	23
5.15.3	Use data	23
5.15.4	Packaging data and labeling	23
5.15.5	Storage data	24
5.16	Cupric carbonate, basic, analyzed reagent	24
5.16.1	Specifications	24
5.16.2	Technical description	24
5.16.3	Use data	25
5.16.4	Packaging data and labeling	25
5.16.5	Storage data	25
5.17	Cupric chloride, dihydrate, analyzed reagent	25
5.17.1	Specifications	25
5.17.2	Technical description	25
5.17.3	Use data	26
5.17.4	Packaging data and labeling	26
5.17.5	Storage data	26
5.18	Cupric sulfate, anhydrous, analyzed reagent	26
5.18.1	Specifications	26
5.18.2	Technical description	26
5.18.3	Use data	26
5.18.4	Packaging data and labeling	26
5.18.5	Storage data	26
5.19	Cuprous oxide, analyzed reagent	27
5.19.1	Specifications	27
5.19.2	Technical description	27
5.19.3	Use data	27
5.19.4	Packaging data and labeling	27
5.19.5	Storage data	27

21

Downloaded from http://www.everyspec.com

Page

Paragraph 5.20 Ferric chloride, anhydrous, analyzed reagent ---- 27
5.20.1 Specifications ---- 27
5.20.2 Technical description ---- 27
5.20.3 Use data ---- 28
5.20.4 Packaging data and labeling ---- 28
5.20.5 Storage data ---- 28
5.21 Ferric sulfate, hydrated, analyzed reagent ---- 28
5.21.1 Specifications ---- 28
5.21.2 Technical description ---- 28
5.21.3 Use data ---- 29
5.21.4 Packaging data and labeling ---- 29
5.21.5 Storage data ---- 29
5.22 Iodine monochloride, reagent ---- 29
5.22.1 Specifications ---- 29
5.22.2 Technical description ---- 29
5.22.3 Use data ---- 29
5.22.4 Packaging data and labeling ---- 29
5.22.5 Storage data ---- 30
5.23 Iodine pentoxide, analyzed reagent ---- 30
5.23.1 Specifications ---- 30
5.23.2 Technical description ---- 30
5.23.3 Use data ---- 31
5.23.4 Packaging data and labeling ---- 31
5.23.5 Storage data ---- 31
5.24 Lanthanum nitrate, reagent ---- 32
5.24.1 Specifications ---- 32
5.24.2 Technical description ---- 32
5.24.3 Use data ---- 32
5.24.4 Packaging data and labeling ---- 32
5.24.5 Storage data ---- 32
5.25 Lead oxide, red, analyzed reagent ---- 32
5.25.1 Specifications ---- 32
5.25.2 Technical description ---- 32
5.25.3 Use data ---- 33
5.25.4 Packaging data and labeling ---- 33
5.25.5 Storage data ---- 33
5.26 Lithium sulfate, monohydrate, analyzed reagent ---- 33
5.26.1 Specifications ---- 33
5.26.2 Technical description ---- 33
5.26.3 Use data ---- 34
5.26.4 Packaging data and labeling ---- 34
5.26.5 Storage data ---- 34

Downloaded from http://www.everyspec.com

		Page
Paragraph 5.27	Magnesium carbonate, basic, trihydrate, analyzed reagent	34
5.27.1	Specifications	34
5.27.2	Technical description	34
5.27.3	Use data	35
5.27.4	Packaging data and labeling	35
5.27.5	Storage data	35
5.28	Magnesium iodide, octahydrate, reagent	35
5.28.1	Specifications	35
5.28.2	Technical description	35
5.28.3	Use data	35
5.28.4	Packaging data and labeling	35
5.28.5	Storage data	35
5.29	Magnesium perchlorate, anhydrous, analyzed reagent	36
5.29.1	Specifications	36
5.29.2	Technical description	36
5.29.3	Use data	36
5.29.4	Packaging data and labeling	36
5.29.5	Storage data	37
5.30	Magnesium sulfate, anhydrous, analyzed reagent	37
5.30.1	Specifications	37
5.30.2	Technical description	37
5.30.3	Use data	37
5.30.4	Packaging data and labeling	37
5.30.5	Storage data	38
5.31	Manganese dioxide, analyzed reagent	38
5.31.1	Specifications	38
5.31.2	Technical description	38
5.31.3	Use data	38
5.31.4	Packaging data	38
5.31.5	Storage data	39
5.32	Manganous chloride, tetrahydrate, analyzed reagent	39
5.32.1	Specifications	39
5.32.2	Technical description	39
5.32.3	Use data	39
5.32.4	Packaging data and labeling	39
5.32.5	Storage data	40
5.33	Mercuric cyanide, analyzed reagent	40
5.33.1	Specifications	40
5.33.2	Technical description	40
5.33.3	Use data	40
5.33.4	Packaging data and labeling	40
5.33.5	Storage data	41

Downloaded from http://www.everyspec.com

Page

Paragraph 5.34 Mercuric nitrate, monohydrate, analyzed reagent ---- 41
5.34.1 Specifications ---- 41
5.34.2 Technical description ---- 41
5.34.3 Use data ---- 41
5.34.4 Packaging data and labeling ---- 41
5.34.5 Storage data ---- 42
5.35 Mercurous nitrate, monohydrate, analyzed reagent ---- 42
5.35.1 Specifications ---- 42
5.35.2 Technical description ---- 42
5.35.3 Use data ---- 43
5.35.4 Packaging data and labeling ---- 43
5.35.5 Storage data ---- 43
5.36 Nickel chloride, hexahydrate, analyzed reagent ---- 43
5.36.1 Specifications ---- 43
5.36.2 Technical description ---- 43
5.36.3 Use data ---- 44
5.36.4 Packaging data and labeling ---- 44
5.36.5 Storage data ---- 44
5.37 Nickel nitrate, hexahydrate, analyzed reagent ---- 44
5.37.1 Specifications ---- 44
5.37.2 Technical description ---- 44
5.37.3 Use data ---- 45
5.37.4 Packaging data and labeling ---- 45
5.37.5 Storage data ---- 45
5.38 Palladium chloride, anhydrous, reagent ---- 46
5.38.1 Specifications ---- 46
5.38.2 Technical description ---- 46
5.38.3 Use data ---- 46
5.38.4 Packaging data and labeling ---- 46
5.38.5 Storage data ---- 46
5.39 Palladium sulfate, dihydrate, reagent ---- 46
5.39.1 Specifications ---- 46
5.39.2 Technical description ---- 46
5.39.3 Use data ---- 46
5.39.4 Packaging data and labeling ---- 46
5.39.5 Storage data ---- 46
5.40 Phosphorous oxychloride, analyzed reagent -- 47
5.40.1 Specifications ---- 47
5.40.2 Technical description ---- 47

na

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Page

Paragraph 5.40.3 Use data ---------- 47
5.40.4 Packaging data and labeling ---------- 47
5.40.5 Storage data ---------- 48
5.41 Phosphorous pentachloride, analyzed reagent 48
5.41.1 Specifications ---------- 48
5.41.2 Technical description ---------- 48
5.41.3 Use data ---------- 48
5.41.4 Packaging data and labeling ---------- 48
5.41.5 Storage data ---------- 49
5.42 Phosphorous trichloride, anlayzed reagent -- 49
5.42.1 Specifications ---------- 49
5.42.2 Technical description ---------- 49
5.42.3 Use data ---------- 49
5.42.4 Packaging data and labeling ---------- 49
5.42.5 Storage data ---------- 50
5.43 Potassium arsenate, monobasic, analyzed reagent ---------- 50
5.43.1 Specifications ---------- 50
5.43.2 Technical description ---------- 50
5.43.3 Use data ---------- 50
5.43.4 Packaging data and labeling ---------- 50
5.43.5 Storage data ---------- 51
5.44 Potassium bi-iodate, analyzed reagent ------ 51
5.44.1 Specifications ---------- 51
5.44.2 Technical description ---------- 51
5.44.3 Use data ---------- 51
5.44.4 Packaging data and labeling ---------- 51
5.44.5 Storage data ---------- 52
5.45 Potassium cyanide, reagent ---------- 52
5.45.1 Specifications ---------- 52
5.45.2 Technical description ---------- 52
5.45.3 Use data ---------- 53
5.45.4 Packaging data and labeling ---------- 53
5.45.5 Storage data ---------- 53
5.46 Potassium fluoride, dihydrate, analyzed reagent ---------- 53
5.46.1 Specifications ---------- 53
5.46.2 Technical description ---------- 53
5.46.3 Use data ---------- 54
5.46.4 Packaging data and labeling ---------- 54
5.46.5 Storage data ---------- 54
5.47 Potassium persulfate, analyzed reagent ----- 54
5.47.1 Specifications ---------- 54
5.47.2 Technical description ---------- 54

Downloaded from http://www.everyspec.com

Page

Paragraph 5.47.3 Use data ---------- 55
5.47.4 Packaging data and labeling ---------- 55
5.47.5 Storage data ---------- 55
4.48 Potassium phosphate, dibasic, anhydrous analyzed reagent ---------- 55
5.48.1 Specifications ---------- 55
5.48.2 Technical description ---------- 56
5.48.3 Use data ---------- 56
5.48.4 Packaging data and labeling ---------- 56
5.48.5 Storage data ---------- 56
5.49 Potassium pyroantimonate, analyzed reagent - 56
5.49.1 Specifications ---------- 56
5.49.2 Technical description ---------- 56
5.49.3 Use data ---------- 57
5.49.4 Packaging data and labeling ---------- 57
5.49.5 Storage data ---------- 57
5.50 Potassium tellurite, analytical reagent --- 57
5.50.1 Specifications ---------- 57
5.50.2 Technical description ---------- 57
5.50.3 Use data ---------- 58
5.50.4 Packaging data and labeling ---------- 58
5.50.5 Storage data ---------- 58
5.51 Silver carbonate, analyzed reagent -------- 58
5.51.1 Specifications ---------- 58
5.51.2 Technical description ---------- 58
5.51.3 Use data ---------- 58
5.51.4 Packaging data and labeling ---------- 59
5.51.5 Storage data ---------- 59
5.52 Silver cyanide, reagent ---------- 59
5.52.1 Specifications ---------- 59
5.52.2 Technical description ---------- 59
5.52.3 Use data ---------- 59
5.52.4 Packaging data and labeling ---------- 59
5.52.5 Storage data ---------- 60
5.53 Silver iodate, analyzed reagent ---------- 60
5.53.1 Specifications ---------- 60
5.53.2 Technical description ---------- 60
5.53.3 Use data ---------- 60
5.53.4 Packaging data and labeling ---------- 60
5.53.5 Storage data ---------- 61

10 1

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			Page
Paragraph	5.54	Silver perchlorate, anhydrous, reagent	61
	5.54.1	Specifications	61
	5.54.2	Technical description	61
	5.54.3	Use data	61
	5.54.4	Packaging data and labeling	61
	5.54.5	Storage data	61
	5.55	Sodium arsenate, dibasic, heptahydrate, analyzed reagent	61
	5.55.1	Specifications	61
	5.55.2	Technical description	62
	5.55.3	Use data	62
	5.55.4	Packaging data and labeling	62
	5.55.5	Storage data	63
	5.56	Sodium arsenite, analyzed reagent	63
	5.56.1	Specifications	63
	5.56.2	Technical description	63
	5.56.3	Use data	63
	5.56.4	Packaging data and labeling	63
	5.56.5	Storage data	64
	5.57	Sodium bisulfate, monohydrate, analyzed reagent	64
	5.57.1	Specifications	64
	5.57.2	Technical description	64
	5.57.3	Use data	64
	5.57.4	Packaging data and labeling	64
	5.57.5	Storage data	64
	5.58	Sodium bisulfite, analyzed reagent	65
	5.58.1	Specifications	65
	5.58.2	Technical description	65
	5.58.3	Use data	65
	5.58.4	Packaging data and labeling	65
	5.58.5	Storage data	65
	5.59	Sodium bromate, analyzed reagent	65
	5.59.1	Specifications	65
	5.59.2	Technical description	65
	5.59.3	Use data	66
	5.59.4	Packaging data and labeling	66
	5.59.5	Storage data	66
	5.60	Sodium bromide, analyzed reagent	66
	5.60.1	Specifications	66
	5.60.2	Technical description	66
	5.60.3	Use data	67
	5.60.4	Packaging data and labeling	67
	5.60.5	Storage data	67

Downloaded from http://www.everyspec.com

Page

Paragraph 5.61 Sodium chlorate, analyzed reagent ---------- 67
5.61.1 Specifications ---------- 67
5.61.2 Technical description ---------- 67
5.61.3 Use data ---------- 68
5.61.4 Packaging data and labeling ---------- 68
5.61.5 Storage data ---------- 68
5.62 Sodium dichromate, dihydrate, analyzed reagent ---------- 68
5.62.1 Specifications ---------- 69
5.62.2 Technical description ---------- 69
5.62.3 Use data ---------- 69
5.62.4 Packaging data and labeling ---------- 69
5.62.5 Storage data ---------- 69
5.63 Sodium hydrosulfite, anhydrous analyzed reagent ---------- 69
5.63.1 Specifications ---------- 69
5.63.2 Technical description ---------- 69
5.63.3 Use data ---------- 70
5.63.4 Packaging data and labeling ---------- 70
5.63.5 Storage data ---------- 70
5.64 Sodium iodide, anhydrous, analyzed reagent - 70
5.64.1 Specifications ---------- 70
5.64.2 Technical description ---------- 70
5.64.3 Use data ---------- 71
5.64.4 Packaging data and labeling ---------- 71
5.64.5 Storage data ---------- 71
5.65 Sodium metabisulfite, analyzed reagent ----- 71
5.65.1 Specifications ---------- 71
5.65.2 Technical description ---------- 71
5.65.3 Use data ---------- 72
5.65.4 Packaging data and labeling ---------- 72
5.65.5 Storage data ---------- 72
5.66 Sodium metasilicate, nonahydrate, analyzed reagent ---------- 72
5.66.1 Specifications ---------- 72
5.66.2 Technical description ---------- 72
5.66.3 Use data ---------- 72
5.66.4 Packaging data and labeling ---------- 72
5.66.5 Storage data ---------- 72
5.67 Sodium molybdate, dihydrate, analyzed reagent ---------- 73
5.67.1 Specifications ---------- 73
5.67.2 Technical description ---------- 73
5.67.3 Use data ---------- 73
5.67.4 Packaging data and labeling ---------- 73
5.67.5 Storage data ---------- 73
5.68 Sodium perborate, tetrahydrate, analyzed reagent ---------- 73

103

Downloaded from http://www.everyspec.com

Page

Paragraph 5.68.1 Specifications ---------- 73
5.68.2 Technical description ---------- 74
5.68.3 Use data ---------- 74
5.68.4 Packaging data and labeling ---------- 74
5.68.5 Storage data ---------- 74
5.69 Sodium perchlorate, anhydrous, analyzed reagent ---------- 74
5.69.1 Specifications ---------- 74
5.69.2 Technical description ---------- 74
5.69.3 Use data ---------- 75
5.69.4 Packaging data and labeling ---------- 75
5.69.5 Storage data ---------- 75
5.70 Sodium selenate, decahydrate, analyzed reagent ---------- 75
5.70.1 Specifications ---------- 75
5.70.2 Technical description ---------- 75
5.70.3 Use data ---------- 76
5.70.4 Packaging data and labeling ---------- 76
5.70.5 Storage data ---------- 76
5.71 Stannic chloride, anhydrous, analyzed reagent ---------- 76
5.71.1 Specifications ---------- 76
5.71.2 Technical description ---------- 76
5.71.3 Use data ---------- 77
5.71.4 Packaging data and labeling ---------- 77
5.71.5 Storage data ---------- 78
5.72 Stannic oxide, reagent ---------- 78
5.72.1 Specifications ---------- 78
5.72.2 Technical description ---------- 78
5.72.3 Use data ---------- 78
5.72.4 Packaging data and labeling ---------- 78
5.72.5 Storage data ---------- 78
5.73 Strontium chloride, hexahydrate, analyzed reagent ---------- 78
5.73.1 Specifications ---------- 78
5.73.2 Technical description ---------- 78
5.73.3 Use data ---------- 79
5.73.4 Packaging data and labeling ---------- 79
5.73.5 Storage data ---------- 79
5.74 Strontium sulfide, reagent ---------- 79
5.74.1 Specifications ---------- 79
5.74.2 Technical description ---------- 79

104

Downloaded from http://www.everyspec.com

Page

Paragraph 5.74.3 Use data ---------- 79
5.74.4 Packaging data and labeling ---------- 79
5.74.5 Storage data ---------- 80
5.75 Thionyl chloride, reagent ---------- 80
5.75.1 Specifications ---------- 80
5.75.2 Technical description ---------- 80
5.75.3 Use data ---------- 80
5.75.4 Packaging data and labeling ---------- 80
5.75.5 Storage data ---------- 81
5.76 Vanadium pentoxide, analyzed reagent ---------- 81
5.76.1 Specifications ---------- 81
5.76.2 Technical description ---------- 81
5.76.3 Use data ---------- 81
5.76.4 Packaging data and labeling ---------- 81
5.76.5 Storage data ---------- 82
5.77 Zinc carbonate, analyzed reagent ---------- 82
5.77.1 Specifications ---------- 82
5.77.2 Technical description ---------- 82
5.77.3 Use data ---------- 82
5.77.4 Packaging data and labeling ---------- 82
5.77.5 Storage data ---------- 82
5.78 Zinc nitrate, hexahydrate, analyzed reagent- 82
5.78.1 Specifications ---------- 82
5.78.2 Technical description ---------- 82
5.78.3 Use data ---------- 83
5.78.4 Packaging data and labeling ---------- 83
5.78.5 Storage data ---------- 83
5.79 Zirconyl nitrate, dihydrate, analyzed reagent ---------- 83
5.79.1 Specifications ---------- 84
5.79.2 Technical description ---------- 84
5.79.3 Use data ---------- 84
5.79.4 Packaging data and labeling ---------- 84
5.79.5 Storage data ---------- 84

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TABLES

		Page
Table I	Chemical requirements for aluminum nitrate, nonahydrate analyzed reagent	9
II	Chemical requirements for aluminum oxide, anhydrous, analyzed reagent	10
III	Chemical and physical requirements for antimony trichloride, analyzed reagent	11
IV	Chemical requirements for antimony trioxide, analyzed reagent	12
V	Chemical requirements for arsenic trichloride, analyzed reagent	13
VI	Chemical requiements for barium dioxide, anhydrous, analyzed reagent	14
VII	Chemical requirements for barium perchlorate, anhydrous, analyzed reagent	15
VIII	Chemical requirements for bismuth nitrate, pentahydrate, analyzed reagent	16
IX	Chemical and physical requirements for cadmium nitrate, tetrahydrate, analyzed reagent	18
X	Chemical requirements for calcium fluoride, analyzed reagent	19
XI	Chemical requirements for calcium nitrate, tetrahydrate, analyzed reagent	20
XII	Chemical requirements for ceric sulfate, anhydrous analyzed reagent	21
XIII	Chemical requirements for chromic chloride, hexahydrate analyzed reagent	22
XIV	Chemical requirements for chromic nitrate, monohydrate, analyzed reagent	23
XV	Chemical requirements for cupric carbonate, basic, analyzed reagent	24
XVI	Chemical requirements for cupric chloride, dihydrate, analyzed reagent	25
XVII	Chemical requirements for cupric sulfate, anhydrous, analyzed reagent	26
XVIII	Chemical requirements for cuprous oxide, analyzed reagent	27
XIX	Chemical requirements for ferric chloride, anhydrous, analyzed reagent	28
XX	Chemical requirements for ferric sulfate, hydrated, analyzed reagent	29
XXI	Chemical requriements for iodine pentoxide, analyzed reagent	31
XXII	Chemical requirements for lead oxide, red, analyzed reagent	33
XXIII	Chemical requirements for lithium sulfate, monohydrate, analyzed reagent	34

Downloaded from http://www.everyspec.com

Page

Table XXIV Typical properties of magnesium carbonate, basic, trihydrate, analyzed reagent -------- 35
XXV Chemical requirements for magnesium perchlorate, anhydrous, analyzed reagent ---------- 36
XXVI Chemical requirements for magnesium sulfate, anhydrous, analyzed reagent ---------- 37
XXVII Chemical requirements for manganese dioxide, analyzed reagent ---------- 38
XXVIII Chemical requirements for manganous chloride, tetrahydrate, analyzed reagent ---------- 39
XXIX Typical properties of mercuric cyanide, analyzed reagent ---------- 40
XXX Physical and chemical requirements for mercuric nitrate, monohydrate, analyzed reagent ------ 41
XXXI Chemical requirements for mercurous nitrate, monohydrate, analyzed reagent ---------- 42
XXXII Chemical requirements for nickel chloride, hexahydrate, analyzed reagent ---------- 44
XXXIII Chemical requirements for nickel nitrate, hexahydrate, analyzed reagent ---------- 45
XXXIV Physical and chemical requirements for phosphorous oxychloride, analyzed reagent --------- 47
XXXV Chemical requirements for phosphorous pentachloride, analyzed reagent ---------- 48
XXXVI Physical and chemical requirements for phosphorous trichloride, analyzed reagent ------ 49
XXXVII Typical properties of potassium arsenate, analyzed reagent ---------- 50
XXXVIII Chemical requirements for potassium bi-iodate, analyzed reagent ---------- 51
XXXIX Chemical requirements for potassium cyanide, reagent ---------- 52
XL Typical properties of potassium fluoride, dihydrate, analyzed reagent ---------- 54
XLI Chemical requirements for potassium persulfate, analyzed reagent ---------- 55
XLII Physical and chemical requirements for potassium phosphate, dibasic, anhydrous, analyzed reagent ---------- 56
XLIII Typical properties of potassium tellurite, analyzed reagent ---------- 57
XLIV Typical properties of silver carbonate, analyzed reagent ---------- 58
XLV Typical properties of silver iodate, analyzed reagent ---------- 60
XLVI Chemical and physical requirements for sodium arsenate, dibasic, heptahydrate, analyzed reagent ---------- 62

Downloaded from http://www.everyspec.com

Page

Table XLVII Chemical requirements for sodium arsenite, analyzed reagent ---------- 63
XLVIII Chemical requirements for sodium bisulfate, monohydrate, analyzed reagent ---------- 64
XLIX Chemical requirements for sodium bisulfite, analyzed reagent ---------- 65
L Chemical requriements for sodium bromate, analyzed reagent ---------- 66
LI Chemical requirements for sodium bromide, analyzed reagent ---------- 67
LII Chemical requirements for sodium chlorate, analyzed reagent ---------- 68
LIII Typical properties of sodium dichromate, dihydrate, analyzed reagent ---------- 69
LIV Chemical requirements for sodium hydrosulfite, anhydrous, analyzed reagent ---------- 70
LV Chemical requirements for sodium metabisulfite, analyzed reagent ---------- 71
LVI Typical properties of sodium metasilicate, nonahydrate, analyzed reagent ---------- 72
LVII Chemical requirements for sodium molybdate, dihydrate, analyzed reagent ---------- 73
LVIII Chemical requirements for sodium perborate, tetrahydrate, analyzed reagent ---------- 74
LIX Chemical requiements for sodium perchlorate, anhydrous, analyzed reagent ---------- 75
LX Chemical requirements for sodium selenate, decahydrate, analyzed reagent ---------- 76
LXI Chemical requirements for stannic chloride, anhydrous, analyzed reagent ---------- 77
LXII Chemical requirements for stannic oxide, analyzed reagent ---------- 78
LXIII Chemical requirements for strontium chloride, hexahydrate, analyzed reagent ---------- 79
LXIV Chemical requirements for thionyl chloride, reagent ---------- 80
LXV Chemical requirements for vanadium pentoxide, analyzed reagent ---------- 81
LXVI Typical properties of zinc carbonate, analyzed reagent ---------- 82
LXVII Chemical requirements for zinc nitrate, hexahydrate, analyzed reagent ---------- 83
LXVIII Typical properties of zirconyl nitrate, dihydrate, analyzed reagent ---------- 84

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1. SCOPE

1.1 Coverage. This standard is a presentation of nomenclature, formulas, chemical and physical properties and requirements, military use, packaging data, labeling, storage information, and shelf life of all military inorganic salts and compounds, analyzed reagent and reagent grade. This standard does not necessarily include all classifications of the items represented by the title or those which are commercially available. It does contain items preferred for use in the selection of inorganic salts and compounds, analyzed reagent and reagent grade for application by the Department of Defense. This standard covers the following ninety-three items:

NAME	NO. OF ITEMS
ALUMINUM NITRATE, NONAHYDRATE ANALYZED REAGENT	2
ALUMINUM OXIDE, ANHYDROUS, ANALYZED REAGENT	1
ANTIMONY TRICHLORIDE, ANALYZED REAGENT	1
ANTIMONY TRIOXIDE, ANALYZED REAGENT	1
ARSENIC TRICHLORIDE, ANALYZED REAGENT	2
BARIUM DIOXIDE ANHYDROUS, ANALYZED REAGENT	1
BARIUM PERCHLORATE, ANHYDROUS, ANALYZED REAGENT	1
BISMUTH NITRATE, PENTRAHYDRATE, ANALYZED REAGENT	2
BISMUTH OXYIODIDE, REAGENT	1
CADMIUM NITRATE, TETRAHYDRATE, ANALYZED REAGENT	1
CALCIUM FLUORIDE, ANALYZED REAGENT	1
CALCIUM NITRATE, TETRAHYDRATE, ANALYZED REAGENT	1
CERIC SULFATE, ANHYDROUS, ANALYZED REAGENT	1
CHROMIC CHLORIDE, HEXAHYDRATE, ANALYZED REAGENT	1
CHROMIC NITRATE, NONAHYDRATE, ANALYZED REAGENT	1
CUPRIC CARBONATE, BASIC, ANALYZED REAGENT	1
CUPRIC CHLORIDE, DIHYDRATE, ANALYZED REAGENT	2
CUPRIC SULFATE, ANHYDROUS, ANALYZED REAGENT	1
CUPROUS OXIDE, ANALYZED REAGENT	1
FERRIC CHLORIDE, ANHYDROUS, ANALYZED REAGENT	1
FERRIC SULFATE, HYDRATED, ANALYZED REAGENT	2
IODINE MONOCHLORIDE, REAGENT	1
IODINE PENTOXIDE, ANALYZED REAGENT	1
LANTHANUM NITRATE, REAGENT	1
LEAD OXIDE, RED, ANALYZED REAGENT	1
LITHIUM SULFATE, MONOHYDRATE, ANALYZED REAGENT	1
MAGNESIUM CARBONATE, BASIC, TRIHYDRATE, ANALYZED REAGENT	1
MAGNESIUM IODIDE, OCTAHYDRATE, ANALYZED REAGENT	1
MAGNESIUM PERCHLORATE, ANHYDROUS, ANALYZED REAGENT	1
MAGNESIUM SULFATE, ANHYDROUS, ANALYZED REAGENT	1
MANGANESE DIOXIDE, ANALYZED REAGENT	1
MANGANOUS CHLORIDE, TETRAHYDRATE, ANALYZED REAGENT	1

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MERCURIC CYANIDE, ANALYZED REAGENT	1
MERCURIC NITRATE, MONOHYDRATE, ANALYZED REAGENT	2
MERCUROUS NITRATE, MONOHYDRATE	2
NICKEL CHLORIDE, HEXAHYDRATE, ANALYZED REAGENT	1
NICKEL NITRATE, HEXAHYDRATE, ANALYZED REAGENT	2
PALLADIUM CHLORIDE, DIHYDRATE, REAGENT	1
PALLADIUM SULFATE, DIHYDRATE, REAGENT	1
PHOSPHOROUS OXYCHLORIDE, ANALYZED REAGENT	1
PHOSPHOROUS PENTACHLORIDE, ANALYZED REAGENT	1
PHOSPHOROUS TRICHLORIDE, ANALYZED REAGENT	1
POTASSIUM ARSENATE, MONOBASIC, ANALYZED REAGENT	1
POTASSIUM BI-IODATE, ANALYZED REAGENT	1
POTASSIUM CYANIDE, REAGENT	1
POTASSIUM FLUORIDE, DIHYDRATE, ANALYZED REAGENT	1
POTASSIUM PERSULFATE, ANALYZED REAGENT	1
POTASSIUM PHOSPHATE, DIBASIC, ANHYDROUS, ANALYZED REAGENT	1
POTASSIUM PYROANTIMONATE, ANALYZED REAGENT	1
POTASSIUM TELLURITE, ANALYTICAL REAGENT	1
SILVER CARBONATE, ANALYZED REAGENT	1
SILVER CYANIDE, REAGENT	1
SILVER IODATE, ANALYZED REAGENT	1
SILVER PERCHLORATE, ANHYDROUS, REAGENT	1
SODIUM ARSENATE, DIBASIC, HEPTAHYDRATE, ANALYZED REAGENT	2
SODIUM ARSENITE, ANALYZED REAGENT	2
SODIUM BISULFATE, MONOHYDRATE, ANALYZED REAGENT	1
SODIUM BISULFITE, ANALYZED REAGENT	1
SODIUM BROMATE, ANALYZED REAGENT	2
SODIUM BROMIDE, ANALYZED REAGENT	1
SODIUM CHLORATE, ANALYZED REAGENT	1
SODIUM DICHROMATE, DIHYDRATE, ANALYZED REAGENT	1
SODIUM HYDROSULFITE, ANHYDROUS, ANALYZED REAGENT	1
SODIUM IODIDE, ANHYDROUS, ANALYZED REAGENT	1
SODIUM METABISULFITE, ANALYZED REAGENT	2
SODIUM METASILICATE, NONAHYDRATE, ANALYZED REAGENT	1
SODIUM MOLYBDATE, DIHYDRATE, ANALYZED REAGENT	1
SODIUM PERBORATE, TETRAHYDRATE, ANALYZED REAGENT	1
SODIUM PERCHLORATE, ANHYDROUS, ANALYZED REAGENT	1
SODIUM SELENATE, DECAHYDRATE, ANALYZED REAGENT	1
STANNIC CHLORIDE, ANHYDROUS, ANALYZED REAGENT	1
STANNIC OXIDE, REAGENT	1
STRONTIUM CHLORIDE, HEXAHYDRATE, ANALYZED REAGENT	2
STRONTIUM SULFIDE, REAGENT	1
THIONYL CHLORIDE, REAGENT	1
VANADIUM PENTOXIDE, ANALYZED REAGENT	1
ZINC CARBONATE, ANALYZED REAGENT	1
ZINC NITRATE, HEXAHYDRATE, ANALYZED REAGENT	1
ZIRCONYL NITRATE, DIHYDRATE, ANALYZED REAGENT	2

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1.2 Application. Items listed herein accommodate essential requirements of the military and defense agencies and will effect continued economies in all logistic functions when properly employed in new application. This MIL-STD supersedes the following MS sheets:

MS36110-3	MS36119-1	MS36128-1
MS36110-4	MS36119-2	MS36129-5
MS36110-5	MS36119-3	MS36129-4
MS36112-1	MS36119-4	MS36130-7
MS36112-2	MS36121-1	MS36130-8
MS36113-1	MS36121-2	MS36130-11
MS36113-2	MS36121-3	MS36130-12
MS36114-6	MS36121-11	MS36132-1
MS36114-7	MS36121-13	MS36132-2
MS36115-1	MS36121-14	MS36133-1
MS36115-2	MS36122-3	MS36134-1
MS36116-2	MS36122-7	MS36134-2
MS36117-8	MS36122-8	MS36134-5
MS36117-9	MS36125-1	MS36141-1
MS36117-10	MS36125-2	MS36141-2
MS36117-11	MS36126-5	MS36145
MS36118-3	MS36127-2	

2. REFERENCED DOCUMENTS

The issues of the following documents in effect on the date of invitations for bid form a part of this standard to the extent specified herein.

Federal Specifications

O-A-565	Antimony Trichloride, Analyzed Reagent
O-C-265	Chemicals, Analytical; General Specification For
O-T-370	Thionyl Chloride, Reagent
PPP-C-300	Chemicals, Liquid; Packaging and Packing of
PPP-C-301	Chemicals, Dry and Paste; Packaging and Packing of

Military Specifications

MIL-C-11162	Calcium Fluoride, Powder, Reagent
MIL-C-11163	Cuprous Oxide, Analyzed Reagent
MIL-C-11336	Chromium Chloride, Hexahydrate, Analyzed Reagent
MIL-C-14005	Cupric Carbomate, Basic, Analyzed Reagent
MIL-C-51262	Cupric Chloride, Dihydrate, Analyzed Reagent
MIL-C-51263	Chromic Nitrate, Nonahydrate, Analyzed Reagent

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MIL-M-51271	Manganous Chloride, Tetrahydrate, Analyzed Reagent
MIL-M-51273	Mercuric Nitrate, Monohydrate, Analyzed Reagent
MIL-P-10398	Phosphorous Trichloride
MIL-P-11160	Potassium Anitmonate, Pyro, Reagent
MIL-P-36248	Potassium Phosphate, Dibasic, Anhydrous, Analyzed Reagent, 1/4 lb (113.4 GM)
MIL-P-51267	Potassium Bi-Iodate, Analyzed Reagent
MIL-P-51268	Potassium Persulfate, Analyzed Reagent
MIL-P-51269	Phosphorous Pentachloride, Analyzed Reagent
MIL-P-51272	Palladium Chloride, Anhydrous, Reagent
MIL-S-11161	Sodium Dichromate, Dihydrate, Analyzed Reagent
MIL-S-11173	Sodium Bromate, Reagent
MIL-S-14022	Sodium Perborate, Tetrahydrate
MIL-S-14063	Sodium Bromide, Analyzed Reagent
MIL-S-51265	Sodium Bisulfite, Analyzed Reagent
MIL-S-51266	Sodium Bisulfate, Monohydrate, Analyzed Reagent
MIL-S-51270	Stannic Oxide, Analyzed Reagent
MIL-S-51294	Stannic Chloride, Anhydrous, Analyzed Reagent
MIL-S-51295	Strontium Chloride, Hexahydrate, Analyzed Reagent
MIL-S-51309	Sodium Chlorate, Analyzed Reagent
MIL-Z-11143	Zinc Nitrate, Reagent

Rules and Regulations

Title 49, Code of Federal Regulations, DoT

Purchase Descriptions

4-138	Barium Dioxide, Reagent
4-140	Bismuth Nitrate, Pentahydrate, Analyzed Reagent
4-160	Cadmium Nitrate, Tetrahydrate, Analyzed Reagent
4-164	Lead Oxide, Red, Analyzed Reagent
4-167	Barium Perchlorate, Anhydrous, Analyzed Reagent
4-182	Sodium Selenate, Decahydrate, Analyzed Reagent
4-183	Nickel Chloride, Hexahydrate, Analyzed Reagent
4-186	Sodium Arsenate, Heptahydrate, Analyzed Reagent
4-187	Sodium Meta Arsenite, Analyzed Reagent
4-190	Nickel Nitrate, Hexahydrate, Analyzed Reagent
4-192	Phosphorous Trichloride, Analyzed Reagent
4-195	Sodium Perchlorate, Anhydrous, Analyzed Reagent
4-329	Iodine Monochloride, Reagent

Other Documents

Manufacturing Chemists' Association Manual L-1, Guide to Precautionary Labeling of Hazardous Chemicals (Sixth Edition - 1961).

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3. GLOSSARY

3.1 Definitions

Amorphous - A substance that has no definite form and is not crystallized.

Analyzed reagent - Denotes high quality chemicals which are suitable for exacting analytical work and which bear a label giving a statement of the maximum percentages of the important impurities present. Generally, analyzed reagent grade is comparable to ACS grade for those chemicals where an ACS standard does not exist. All commercial listings of reputed "reagent" chemicals and "CP" chemicals which include an analysis of impurities in the identification label shall be designated as analyzed reagent, provided they are not ACS grade. Also, chemicals meeting the specification of "reagent" chemicals as found in the nonmonographed sections of the "United States Pharmacopeia" or "The National Formulary" shall be designated as analyzed reagent. Identifications of chemicals of analyzed reagent grade which exceed the normal impurities limitation for this grade must be further expanded to indicate any significantly lower impurity limits. These items are normally identified in trade by a statement such as "Low in Iron", "Free from Arsenic".

Anhydrous - Pertaining to a salt that has no water of hydration present in the crystalline structure.

Assay - Analysis of a substance to determine the amount, expressed as a percent by weight, of one or more main ingredients.

Boiling point - The temperature at which the vapor pressure of a liquid is equal to the external pressure. In this standard, if there is no mention of the external pressure at which the boiling point was determined, it is understood to be approximately one atmosphere (760 mm mercury).

Decomposition - The chemical separation of a substance into two or more simpler substances which differ from each other and from the original substance.

Deliquescent - The ability to take up water until dissolved.

Formula weight - The sum of the atomic weights of all the atoms appearing in a chemical formula.

Hazardous substance - Any substance or mixture of substances which is (1) toxic; (2) corrosive; (3) an irritant; (4) a strong sensitizer; (5) flammable, or which (6) generates pressure through decomposition, heat, or other means, if such substance or mixture of substances may cause substantial personal injury a substantial illness during or as a direct result of any customary or reasonably anticipated handling or use.

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Hygroscopic - The property of absorbing moisture from the atmosphere but not particularly enough to dissolve. All deliquescent substances are hygroscopic, but not all hygroscopic substances are deliquescent.

Melting point - The temperature at which a liquid and a solid exist together in equilibrium and the transition from the solid to liquid occurs. For pure substances, the melting point and freezing point are the same temperature.

Nonactinic - A material, such as amber - colored glass, that will not permit light radiation to affect a chemical.

Reagent - Any substance used in a reaction for the purpose of detecting, measuring, examining, or producing other substances.

Reagent grade - Denotes a grade of chemicals which do not bear a label stating the percentage of the important impurities present. Reagent grade chemicals have limited use in analytical work because of the uncertainty as to the kind and amount of impurities present. These chemicals find extensive use in laboratory synthesis and in certain analytical procedures where the inherent impurities are not critical to the intended reaction.

Specific gravity - The ratio of the mass of a substance per unit volume at a stated temperature to the mass of the same volume of gas-free distilled water at a stated temperature. In this standard, the first temperature indicates the temperature of the material, and the second indicates the temperature of the water to which it is referred. If there is no mention of the temperature, (20/4°C) is to be assumed.

3.2 Abbreviations. The same abbreviation is used for all tenses, the possessive case, and the singular and plural forms of a given word.

C - Celsius (formerly centigrade)

DoT - Department of Transportation

F - Fahrenheit

FW - Formual Weight

g - gram

lb - pound

MIL-STD - Military Standard

min - minimum

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mm - millimeter

oz - ounce

ppt - precipitate

4. GENERAL REQUIREMENTS

4.1 Chemical and physical requirements. When military or federal specifications establish requirements for the degree of purity of the chemicals listed in this standard, those chemical and physical properties are tabulated as requirements. These requirements are subject to change as specifications are revised. When no chemical or physical requirements are imposed or no specification exists, the chemical and physical properties are tabulated as constants or typical properties. All values given in tables of chemical and physical requirements are in maximum percentage by weight unless otherwise specified.

4.2 Nomenclature. Department of Defense item names used throughout this standard are in capital letters. Other names that are sometimes used are in small letters immediately beneath.

4.3 Packaging data and labeling. All liquid chemicals included in this standard shall be packaged in accordance with Federal Specification PPP-C-300 and all applicable documents mentioned therein. All dry chemicals included in this standard shall be packaged in accordance with Federal Specification PPP-C-301 and all applicable documents mentioned therein. The precautionary labeling prescribed in this standard is not intended to replace or substitute for precautionary labeling required by federal or state laws or regulations. When labels required by statute contain essentially the same information, the label prescribed by this standard is not required in addition thereto. The precautionary labeling prescribed in this standard is based on the latest (Sixth Edition - 1961) edition of the Manufacturing Chemists' Association Manual, L-1, Guide to Precautionary Labeling of Hazardous Chemicals. Legends given in later editions of this manual comply with the requirements of this standard.

4.4 Safety. All compounds in this standard which are hazardous are so indicated beneath each item name. Care in the handling and use of all chemicals is one of the first principles in a laboratory and no amount of precautionary labeling can take the place of such care. General safety precautions, where applicable, are outlined in this standard. For more specific information, the proper safety or medical authorities should be consulted in order to determine personal protective measures and environmental controls.

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4.5 Shelf life. Factors such as moisture, temperature, type and condition of container, and exposure to sunlight and the atmosphere cause variations in shelf life. Ideal storage conditions are outlined for each item. The term "indefinite" shall denote stability for 1 year or more. The term "cool" denotes ambient temperatures (above freezing to 100°F) when stored out of direct sunlight. The term "dry" is usually used to denote an area where condensation does not come in contact with the packages or contents (for example, storing on pallets away from walls in an enclosure or building). Periodic examinations of the material should be made more frequently when storage conditions vary from the ideal. For applications where quality may be critical each compound should be analyzed prior to use. Shelf life is dated from the date of manufacture. All chemicals in this standard shall be of the most recent preparation.

4.6 Solubility data. Solubility data is only given for the most common solvents.

4.7 Temperature. If the temperature at which a property was determined is not specified, it is understood to be room temperature (20°C to 25°C, or 68°F to 77°F).

4.8 Substitutability and interchangeability. Unless otherwise indicated under the individual descriptive data, none of the chemicals included in this standard are completely interchangeable with other items in the standard or chemicals of another grade. Certain materials in this standard may be used as substitutes for a specific application of another grade or of another chemical. This limited substitutability however, would be at the discretion of the chemist and for a specific purpose.

5. DETAIL REQUIREMENTS

5.1 Name. ALUMINUM NITRATE, NONAHYDRATE, ANALYZED REAGENT (HAZARDOUS) $Al(NO_3)_3 \cdot 9H_2O$ FW 375.15

5.1.1 Specifications. MIL-A-51311, Aluminum Nitrate, Nonahydrate, Analyzed Reagent

5.1.2 Technical description. Aluminum nitrate, nonahydrate is in the form of white or colorless deliquescent crystals. It is soluble in cold water, alcohol, and ether; it decomposes in hot water. It has a melting point of 70 - 73°C and decomposes at 134°C. It is a strong oxidizer. Aluminum nitrate, nonahydrate, analyzed reagent shall conform to the requirements as shown in Table I.

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Table I. - Chemical requirements for aluminum nitrate, nonahydrate, analyzed reagent

Property	Requirement
Assay, as $Al(NO_3)_3 \cdot 9H_2O$ (min)	99.0
Maximum limits of impurities:	
Insoluble material	0.005
Chloride (Cl)	0.001
Sulfate (SO_4)	0.005
Heavy metals (as Pb)	0.001
Iron (Fe)	0.002
Substances not ppt by ammonium hydroxide	0.10

5.1.3 Use data. Aluminum nitrate, nonahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.1.4 Packaging data and labeling. Aluminum nitrate, nonahydrate, analyzed reagent, is packaged for military use in 1/4 lb and 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

ALUMINUM NITRATE

WARNING! STRONG OXIDANT
HARMFUL IF SWALLOWED

Store separately from and avoid contact with combustible materials.
Keep away from open flame and sparks.
Wash thoroughly before eating or smoking.

5.1.5 Storage data. Aluminum nitrate, nonahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from open flame, sparks, sources of heat and combustible materials. Under these conditions the shelf life is indefinite.

5.2 Name. ALUMINUM OXIDE, ANHYDROUS, ANALYZED REAGENT Al_2O_3 FW 101.96

5.2.1 Specifications. None.

5.2.2 Technical description. Aluminum oxide, anhydrous is in the form of a white crystalline powder. It is insoluble in water and difficultly soluble in mineral acids and strong alkali. It has a density of 3.5 to 4.0, a melting point of 1999 - 2032°C, and a boiling point of 2210°C. Aluminum oxide, anhydrous, analyzed reagent shall conform to the requirements as shown in Table II.

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Table II. - Chemical requirements of aluminum oxide, anhydrous, analyzed reagent

Property	Requirement
Assay (as Al_2O_3) min	98.5
Maximum limits of impurities:	
Chloride (Cl)	0.010
Iron (Fe)	0.005
Heavy metals (as Pb)	0.002
Loss of ignition	1.0
Sulfate (SO_4)	0.010

5.2.3 Use data. Aluminum oxide, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent. It is used for absorbing gases and water vapors and in chromatographic analysis.

5.2.4 Packaging data and labeling. Aluminum oxide, anhydrous, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.2.5 Storage data. Aluminum oxide, anhydrous, analyzed reagent should be stored in a cool dry place in tightly sealed containers. The estimated shelf life if 1 year from date of manufacture. For critical analytical work it is recommended that this material be analyzed for moisture content prior to use.

5.3 Name. ANTIMONY TRICHLORIDE, ANALYZED REAGENT $SbCl_3$ FW 228.13
Antimonous Chloride
Antimony Chloride
(HAZARDOUS)

5.3.1 Specifications. Federal Specification O-A-565, Antimony Trichlorite, Analyzed Reagent.

5.3.2 Technical description. Antimony trichloride, is in the form of colorless crystals or translucent masses. It is very soluble in water and soluble in alcohol, benzene, ether and acetone. It has a melting point of 73.2°C, a boiling point of 223.5°C, and a specific gravity of 3.14. Antimony trichloride, analyzed reagent shall conform to the requirements shown in Table III.

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Table III. - Chemical and physical requirements for antimony trichloride, analyzed reagent

Property	Requirement
Form and color	Colorless crystals or translucent masses
Maximum limits of impurities:	
Arsenic (As)	0.02
Iron (Fe)	0.002
Heavy metals (as Pb)	0.005
Sulfate (SO_4)	0.005
Substances not precipitated by hydrogen sulfide	0.10

5.3.3 Use data. Antimony trichloride, analyzed reagent, is intended for military use as a general laboratory reagent. It is used as a reagent for chloral, aromatic hydrocarbons, for molecular weight determinations and in the identification of drugs.

5.3.4 Packaging data and labeling. Antimony trichloride, analyzed reagent, is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must bear the following precautionary label:

ANTIMONY TRICHLORIDE

DANGER! CAUSES SEVERE BURNS
VAPOR HAZARDOUS

Do not get in eyes, on skin, on clothing.
Do not breathe vapor.
Keep container closed.
In case of contact, immediately remove all contaminated clothing and flush skin or eyes with plenty of water for at least 15 minutes; for eyes, get medical attention.
Wash clothing before reuse.

5.3.5 Storage data. Antimony trichloride, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.4 Name. ANTIMONY TRIOXIDE, ANALYZED REAGENT Sb_2O_3 FW 291.52
Antimony Oxide
(HAZARDOUS)

5.4.1 Specifications. None

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5.4.2 Technical description. Antimony trioxide is in the form of a white, odorless, crystalline powder. It is insoluble in water and soluble in concentrated hydrochloric acid and strong alkalies. It has a specific gravity of 5.67 and a melting point of 655°C. Antimony trioxide, analyzed reagent shall conform to the requirements shown in Table IV.

Table IV. - Chemical requirements for antimony trioxide, analyzed reagent

Property	Requirement
Assay (as Sb_2O_3) min	99.0
Maximum limits of impurities:	
Arsenic (As)	0.20
Chloride (Cl)	0.005
Iron (Fe)	0.010
Sulfates (SO_4)	0.01

5.4.3 Use data Antimony trioxide, analyzed reagent is intended for military use as a general laboratory reagent.

5.4.4 Packaging data and labeling. Antimony trioxide, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must bear the following precautionary label:

ANTIMONY TRIOXIDE

CAUTION! HARMFUL IF SWALLOWED

Wash thoroughly after handling.

5.4.5 Storage data. Antimony trioxide, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.5 Name. ARSENIC TRICHLORIDE, ANALYZED REAGENT $AsCl_3$ FW 181.28
Arsenic Chloride
Arsenious Chloride
Arsenous Chloride
(HAZARDOUS)

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5.5.1 Specifications. None.

5.5.2 Technical description. Arsenic trichloride is a colorless or pale yellow, oily liquid. It is soluble in concentrated hydrochloric acid and most organic liquids. It is decomposed by water. It fumes in moist air, and is caustic and corrosive. It has a boiling point of 130.5°C, a melting point of -18°C and a specific gravity of 2.163 (14/4°C). Arsenic trichloride, analyzed reagent shall conform to the requirements shown in Table V.

Table V. - Chemical requirements for arsenic trichloride, analyzed reagent

Property	Requirement
Maximum limits of impurities:	
Sulfate (SO_4)	0.001
Iron (Fe)	0.002

5.5.3 Use data. Arsenic trichloride is intended for military use as a general laboratory reagent.

5.5.4 Packaging data and labeling. Arsenic trichloride, analyzed reagent is packaged for military use in 1/4 lb and 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.345 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT poison B label. In addition, individual containers must bear the following precautionary label:

ARSENIC TRICHLORIDE

DANGER! MAY BE FATAL IF SWALLOWED
LIBERATES POISONOUS GAS WHEN HEATED

Avoid breathing spray mist.
Avoid contact with skin, eyes, and clothing.
Wash thoroughly after handling.

POISON
CALL A PHYSICIAN

5.5.5 Storage data. Arsenic trichloride, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions the shelf life is indefinite.

5.6 Name. BARIUM DIOXIDE, ANHYDROUS, ANALYZED REAGENT BaO_2 FW 169.36
Barium Binoxide
Barium Peroxide
(HAZARDOUS)

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5.6.1 Specifications. None.

5.6.2 Technical description. Barium dioxide is a grayish-white powder. It is insoluble in water but it is slowly decomposed by contact with it. Above 600°C it decomposes into oxygen and barium oxide. It has a specific gravity of 4.96 and a melting point of 450°C. Barium dioxide shall conform to the requirements of Edgewood Arsenal Purchase Description 4-138, as shown in Table VI.

Table VI. - Chemical requirements for barium dioxide, anhydrous, analyzed reagent

Property	Requirement
Assay (as BaO_2) min	85.0
Maximum limits of impurities:	
Alkalies and Calcium (as sulfates)	
Chloride (Cl)	0.02
Insoluble in HCl	0.02
Heavy metals (as Pb)	0.004
Iron (Fe)	0.02

5.6.3 Use data. Barium dioxide, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent. It is used as an oxidizing agent in organic synthesis.

5.6.4 Packaging data and labeling. Barium dioxide, anhydrous, analyzed reagent is packaged for military use in 1 oz and 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

BARIUM DIOXIDE

DANGER! STRONG OXIDANT
HARMFUL IF SWALLOWED

Store separately from and avoid contact with combustible materials.
Keep away from heat, sparks, and open flame.
Avoid contact with skin, eyes, and clothing.
In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes; for eyes, get medical attention.
Wash clothing before reuse.

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5.6.5 Storage data. Barium dioxide, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat, sparks, open flame and combustible materials. Under these storage conditions, the shelf life is indefinite.

5.7 Name. BARIUM PERCHLORATE, ANHYDROUS, ANALYZED REAGENT (HAZARDOUS) $Ba(ClO_4)_2$ FW 336.24

5.7.1 Specifications. None.

5.7.2 Technical description. Barium perchlorate is in the form of colorless crystals. It is explosive in contact with combustible materials. It is soluble in water and alcohol. It has a specific gravity of 2.74 and a melting point of 505°C. Barium perchlorate anhydrous, shall conform to the requirements of Edgewood Arsenal Purchase Description 4-167 as shown in Table VII.

Table VII. - Chemical requirements for barium perchlorate, anhydrous, analyzed reagent

Property	Requirement
Maximum limits of impurities:	
Insoluble	0.01
Chloride (Cl)	0.005
Nitrogen compounds	0.001
Alkalies and calcium	0.02
Heavy metals (as Pb)	0.001
Iron (Fe)	0.001

5.7.3 Use data. Barium perchlorate, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent. It is used as a dehydrating agent when more efficient dehydrating agents are not available.

5.7.4 Packaging data and labeling. Barium perchlorate, anhydrous, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. Unless otherwise exempt under section 173.154 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, individual containers must bear the following precautionary label:

BARIUM PERCHLORATE

WARNING! STRONG OXIDANT
FLAMMABLE
HARMFUL IF SWALLOWED
CAUSES SKIN IRRITATION

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Store separately from and avoid contact with combustible materials.
Keep away from heat, sparks, and open flame.
Avoid contact with skin, eyes, and clothing.

5.7.5 Storage data. Barium perchlorate, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from heat, sparks, open flame, and combustible materials. The estimated shelf life of this chemical is 1 year from date of manufacture.

5.8 Name. BISMUTH NITRATE, PENTAHYDRATE, ANALYZED REAGENT $Bi(NO_3)_3 \cdot 5H_2O$
Bismuth Trinitrate FW 485.10
(HAZARDOUS)

5.8.1 Specifications. None.

5.8.2 Technical description. Bismuth nitrate is in the form of lustrous, clear, colorless, hygroscopic crystals. It is soluble in dilute nitric acid, alcohol, and acetone. It is slowly decomposed by water to the subnitrate. It has a specific gravity of 2.83 and decomposes at 75 - 80°C. Bismuth nitrate, pentahydrate, analyzed reagent shall conform to the requirements shown in Table VIII.

Table VIII. - Chemical requirements for bismuth nitrate, pentahydrate, analyzed reagent

Property	Requirement
Maximum limits of impurities:	
Alkalies and earths	0.100
Arsenic (As)	0.001
Chloride (Cl)	0.005
Iron (Fe)	0.005
Lead (Pb)	0.005
Silver (Ag)	0.001
Sulfate (SO_4)	0.010
Copper (Cu)	0.03

5.8.3 Use data. Bismuth nitrate, pentahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.8.4 Packaging data and labeling. Bismuth nitrate, pentahydrate, analyzed reagent is packaged for military use in 1/4 lb and 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, individual containers must bear the following precautionary label:

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BISMUTH NITRATE

WARNING! STRONG OXIDANT
HARMFUL IF SWALLOWED

Store separately from and avoid contact with combustible materials. Wash thoroughly before eating or smoking.

5.8.5 Storage data. Bismuth nitrate, pentahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions the shelf life is indefinite.

5.9 Name. BISMUTH OXYIODIDE, REAGENT BiOI FW 351.88
Bismuth Subiodide
Basic Bismuth Iodide
(HAZARDOUS)

5.9.1 Specifications. None.

5.9.2 Technical description. Bismuth oxyiodide is in the form of an orange to dark red, odorless powder. It is insoluble in water, alcohol, and chloroform, but is soluble in hydrochloric acid. It is decomposed by nitric acid or alkalies. It has a specific gravity of 7.82. Bismuth oxyiodide, reagent should have an assay of approximately 99%.

5.9.3 Use data. Bismuth oxyiodide, reagent is intended for military use as a general laboratory reagent.

5.9.4 Packaging data and labeling. Bismuth oxyiodide, reagent is packaged for military use in 1/4 lb unit quantity nonactinic bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, individual containers must bear the following precautionary label:

BISMUTH OXYIODE

CAUTION! PROTECT FROM LIGHT AND HEAT
LIBERATES POISONOUS GAS WHEN HEATED
HARMFUL IF SWALLOWED

Wash thoroughly after handling.

5.9.5 Storage data. Bismuth oxyiodide, reagent should be stored in a cool, dry place in tightly sealed containers. It should be protected from light and sources of heat. It has a estimated shelf life of 1 year from date of manufacture.

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5.10 Name. CADMIUM NITRATE, TETRAHYDRATE, ANALYZED REAGENT (HAZARDOUS) $Cd(NO_3)_2 \cdot 4H_2O$ FW 308.49

5.10.1 Specifications. None.

5.10.2 Technical description. Cadmium nitrate is in the form of white, prismatic, crystalline needles. It is soluble in water and alcohol. It has a specific gravity of 2.455, a melting point of 59.5°C, and a boiling point of 132°C. Cadmium nitrate, tetrahydrate, analyzed reagent shall conform to the requirements of Edgewood Arsenal Purchase Description 4-160, as shown in Table IX.

Table IX. - Chemical and physical requirements of cadmium nitrate, tetrahydrate, analyzed reagent

Property	Requirement
Color	white
Form	Prismatic needles
Assay, as $Cd(NO_3)_2 \cdot 4H_2O$ (min)	99
Maximum limits of impurities:	
Insolubles	0.005
Chloride (Cl)	0.002
Sulfate (SO_4)	0.005
Alkalies and alkaline earths	0.10
Ammonia	0.010
Copper (Cu)	0.002
Iron (Fe)	0.001
Lead (Pb)	0.005
Zinc (Zn)	0.05

5.10.3 Use data. Cadmium nitrate, tetrahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.10.4 Packaging data and labeling. Cadmium nitrate, tetrahydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, individual containers must bear the following precautionary label:

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CADMIUM NITRATE

DANGER! STRONG OXIDANT
HARMFUL IF SWALLOWED

Store separately from and avoid contact with combustible materials.
Avoid breathing dust.
Avoid contact with skin, eyes, and clothing.

5.10.5 Storage data. Cadmium nitrate, tetrahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions the shelf life is indefinite.

5.11 Name. CALCIUM FLUORIDE, ANALYZED REAGENT (HAZARDOUS) CaF_2 FW 78.08

5.11.1 Specifications. MIL-C-11162, Calcium Fluroide, Powder, Reagent

5.11.2 Technical description. Calcium fluroide is in the form of a white powder. It is insoluble in water and slightly soluble in dilute acids. It reacts with hot sulfuric acid to liberate hydrogen fluoride. It has a specific gravity of 3.18 and a melting point of approximately 1360°C. Calcium fluoride, analyzed reagent shall conform to the requirements shown in Table X.

Table X. - Chemical requirements for calcium fluoride, analyzed reagent

Property	Requirement
Maximum limits of impurities:	
Chloride (Cl)	0.005
Sulfate (SO_4)	0.01
Heavy metals (as Pb)	0.005
Carbonate (CO_3)	0.001

5.11.3 Use data. Calcium fluroide, analyzed reagent is intended for military use as a general laboratory reagent.

5.11.4 Packaging data and labeling. Calcium fluoride, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must bear the following precautionary label:

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CALCIUM FLUORIDE

WARNING! HARMFUL IF SWALLOWED
MAY CAUSE SKIN IRRITATION

Wash thoroughly after handling.

5.11.5 Storage data. Calcium fluoride, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions the shelf life is indefinite.

5.12 Name. CALCIUM NITRATE, TETRAHYDRATE, ANALYZED REAGENT $Ca(NO_3)_2 \cdot 4H_2O$
(HAZARDOUS) FW 236.16

5.12.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.12.2 Technical description. Calcium nitrate is in the form of white deliquescent masses. It is soluble in water, alcohol, and acetone. It has a specific gravity of 1.82 and a melting point of 42°C. Calcium nitrate, tetrahydrate, analyzed reagent shall conform to the requirements shown in Table XI.

Table XI. - Chemical requirements for calcium nitrate, tetrahydrate analyzed reagent

Property	Requirement
Maximum limits of impurities:	
Acidity	0.01
Barium (Ba)	0.005
Chloride (Cl)	0.002
Heavy metals	0.0005
Iron (Fe)	0.0005
Sulfate (SO_4)	0.02
Insolubles	0.005
Magnesium and alkali salts	0.2

5.12.3 Use data. Calcium nitrate, tetrahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.12.4 Packaging data and labeling. Calcium nitrate, tetrahydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

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CALCIUM NITRATE

CAUTION! STRONG OXIDANT
HARMFUL IF SWALLOWED

Do not breathe dust.
Store separately from and avoid contact with combustible materials.
Keep away from heat, sparks, and open flames.

5.12.5 Storage data. Calcium nitrate, tetrahydrate, analyzed reagent should be stored in a cool dry place in tightly sealed containers. It should be stored away from heat, sparks, open flames, and combustible materials. Under these storage conditions, the shelf life is indefinite.

5.13 Name. CERIC SULFATE, ANHYDROUS, ANALYZED REAGENT $Ce(SO_4)_2$
Cerium Sulfate FW 332.24

5.13.1 Specifications. Federal Specifications. O-C-265, Chemicals, Analytical; General Specification For.

5.13.2 Technical description. Ceric sulfate is in the form of yellow to orange-yellow crystals or powder. It is soluble in a small quantity of water, but decomposes with much water, with separation of basic salt. It is soluble in dilute sulfuric acid. It has a specific gravity of 3.91. Curic sulfate, anhydrous, analyzed reagent shall conform to the requirements shown in Table XII.

Table XII. - Chemical requirements for ceric sulfate, anhydrous analyzed reagent

Property	Requirement
Assay, as $Ce(SO_4)_2$, (min)	97.8
Maximum limits of impurities:	
Chloride (Cl)	0.01
Heavy metals	to pass test
Iron (Fe)	to pass test

5.13.3 Use data. Ceric sulfate, anhydrous, analyzed reagent, is intended for military use as a general laboratory reagent. It is used as a reagent for the quantitative determination of nitrate, iodides, ferrous salts and many other substances.

5.13.4 Packaging data and labeling. Ceric sulfate, anhydrous, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

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5.13.5 Storage data. Ceric sulfate, anhydrous, analyzed reagent, should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.14 Name. CHROMIC CHLORIDE, HEXAHYDRATE, ANALYZED REAGENT $CrCl_3.6H_2O$
Chromium Chloride FW 266.48
Chromium Sesquichloride
(HAZARDOUS)

5.14.1 Specifications. MIL-C-11336, Chromic Chloride, Hexahydrate, Analyzed Reagent.

5.14.2 Technical description. Chromic chloride is in the form of dark green granules or lumps. It is very soluble in water, soluble in alcohol, but insoluble in ether. It has a specific gravity of 1.76 and a melting point of 83°C. Chromic chloride, hexahydrate, analyzed reagent shall conform to the requirements shown in Table XIII.

Table XIII. - Chemical requirements for chromic chloride, hexahydrate, analyzed reagent

Property	Requirement
Assay, as Cr (min)	18.9
Maximum limits of impurities:	
Insoluble matter	0.010
Sulfate (SO_4)	0.020
Iron (Fe)	0.010
Substances not ppt. by ammonium hydroxide	0.30

5.14.3 Use data. Chromic chloride, hexahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.14.4 Packaging data and labeling. Chromic chloride, hexahydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must bear the following precautionary label:

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CHROMIC CHLORIDE

CAUTION! HARMFUL IF SWALLOWED
CAUSES SKIN IRRITATION

Do not get in eyes, on skin, or on clothing.
Wash thoroughly after handling.
Keep tightly closed; store in a cool, dry place.

5.14.5 Storage data. Chromic chloride, hexahydrate, analyzed reagent, should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.15 Name. CHROMIC NITRATE, NONAHYDRATE, ANALYZED REAGENT $Cr(NO_3)_3 \cdot 9H_2O$
Chromium Nitrate FW 400.18
(HAZARDOUS)

5.15.1 Specifications. MIL-C-51263, Chromic Nitrate, Nonahydrate, Analyzed Reagent.

5.15.2 Technical description. Chromic nitrate is in the form of purple crystals. It is soluble in water and alcohol. It has a melting point of 60°C and decomposes at 100°C. Chromic nitrate, nonahydrate, analyzed reagent shall conform to the requirements shown in Table XIV.

Table XIV. - Chemical requirements for chromic nitrate, nonahydrate analyzed reagent

Property	Requirement
Assay, as $Cr(NO_3)_3 \cdot 9H_2O$ (min)	98.0
Maximum limits of impurities:	
Chloride (Cl)	0.002
Sulfate (SO_4)	0.005
Iron (Fe)	0.005
Substances not ppt. by ammonium hydroxide	0.10

5.15.3 Use data. Chromic nitrate, nonahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.15.4 Packaging data and labeling. Chromic nitrate, nonahydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT

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yellow label for oxidizing material. In addition, each individual container must bear the following precautionary label:

CHROMIC NITRATE

CAUTION! STRONG OXIDANT
HARMFUL IF SWALLOWED
CAUSES SKIN IRRITATION

Do not get in eyes, on skin, or on clothing.
Wash thoroughly after handling.
Store in a cool, dry area away from combustible materials.

5.15.5 Storage data. Chromic nitrate, nonahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions the shelf life is indefinite.

5.16 Name. CUPRIC CARBONATE, BASIC, ANALYZED REAGENT
Copper Carbonate, Basic Approx. $CuCO_3.Cu(OH_2).H_2O$
(HAZARDOUS)

5.16.1 Specifications. MIL-C-14005, Cupric Carbonate, Basic, Analyzed Reagent

5.16.2 Technical description. Cupric carbonate, basic is in the form of a fine green powder. It is soluble in acids and insoluble in water. It has a specific gravity of 3.7 to 4.0, and it decomposes at 200°C. Cupric carbonate, basic, analyzed reagent shall conform to the requirements shown in Table XV.

Table XV. - Chemical requirements for cupric carbonate, basic, analyzed reagent

Property	Requirement
Assay, as Cu (min)	53.0
Maximum limits of impurities:	
Insoluble matter in HCl	0.020
Chloride (Cl)	0.01
Nitrate (NO_3)	0.05
Sulfate (SO_4)	0.01
Iron (Fe)	0.01
Substances not ppt. by H_2S (as sulfates)	0.50

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5.16.3 Use data. Cupric carbonate, basic, analyzed reagent is intended for military use as a general laboratory reagent.

5.16.4 Packaging data and labeling. Cupric carbonate, basic, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container should bear the following precautionary label:

CUPRIC CARBONATE, BASIC

CAUTION! HARMFUL IF SWALLOWED

Wash thoroughly after handling.

5.16.5 Storage data. Cupric carbonate, basic, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.17 Name. CUPRIC CHLORIDE, DIHYDRATE, ANALYZED REAGENT $CuCl_2.2H_2O$
Copper Chloride FW 170.49

5.17.1 Specifications. MIL-C-51262, Cupric Chloride, Dihydrate, Analyzed Reagent.

5.17.2 Technical description. Cupric chloride, dihydrate is in the form of green or blue-green crystals. It is extremely soluble in water, soluble in alcohol, and slightly soluble in ether. It has a specific gravity of 2.54 at 25°C. Cupric chloride, dihydrate, analyzed reagent shall conform to the requirements as shown in Table XVI.

Table XVI. - Chemical requirements of cupric chloride, dihydrate, analyzed reagent

Property	Requirement
Assay, as $CuCl_2.2H_2O$ (min)	99.0
Maximum limits of impurities:	
Insoluble matter	0.010
Nitrate (NO_3)	0.015
Sulfate (SO_4)	0.005
Iron (Fe)	0.015
Substances not ppt. by H_2S	0.10

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5.17.3 Use data. Cupric chloride, dihydrate, analyzed reagent, is intended for use as a general laboratory reagent.

5.17.4 Packaging data and labeling. Cupric chloride, dihydrate, analyzed reagent is packaged for military use in 1/4 lb and 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.17.5 Storage data. Cupric chloride, dihydrate, analyzed reagent, should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.18 Name. CUPRIC SULFATE, ANHYDROUS, ANALYZED REAGENT $CuSO_4$ FW 159.61

5.18.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.18.2 Technical description. Cupric sulfate, anhydrous is in the form of a greenish white, hygroscopic powder. It is soluble in water and insoluble in alcohol. It has a specific gravity of 3.606 at 15°C and decomposes above 600°C. Cupric sulfate, anhydrous, analyzed reagent shall conform to the requirements of Table XVII.

Table XVII. - Chemical requirements for cupric sulfate, anhydrous, analyzed reagent

Property	Requirement
Assay, as $CuSO_4$ (min)	97.0
Maximum limits of impurities:	
Insoluble matter	0.010
Chloride (Cl)	0.002
Alkalies and earths	0.03
Iron (Fe)	0.020

5.18.3 Use data. Cupric sulfate, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent. It is particularly suitable as a dehydrating agent.

5.18.4 Packaging data and labeling. Cupric sulfate, anhydrous, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.18.5 Storage data. Cupric sulfate, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

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5.19 Name. CUPROUS OXIDE, ANALYZED REAGENT Cu_2O FW 143.08
Copper Oxide, Red

5.19.1 Specifications. MIL-C-11163, Cuprous Oxide, Analyzed Reagent

5.19.2 Technical description. Cuprous oxide is in the form of a reddish-brown crystalline powder. It is insoluble in water, but soluble in acids, ammonium hydroxide, and solutions of ammonium salts. It has a specific gravity of 5.75 - 6.09, a melting point of 1235°C, and a boiling point of 1800°C. Cuprous oxide, analyzed reagent shall conform to the requirements as shown in Table XVIII.

Table XVIII. - Chemical requirements for cuprous oxide, analyzed reagent

Property	Requirement
Assay, as Cu_2O (min)	96.0
Insoluble matter in HNO_3	0.30
Chloride (Cl)	0.50
Sulfate (SO_4)	0.05
Iron (Fe)	0.10
Substances not ppt. by H_2S	0.50

5.19.3 Use data. Cuprous oxide, analyzed reagent, is intended for military use as a general laboratory reagent.

5.19.4 Packaging data and labeling. Cuprous oxide, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.19.5 Storage data. Cuprous oxide, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions the shelf life is indefinite.

5.20 Name. FERRIC CHLORIDE, ANHYDROUS, ANALYZED REAGENT $FeCl_3$
Ferric Trichloride FW 162.22
(HAZARDOUS)

5.20.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.20.2 Technical description. Ferric chloride, anhydrous is in the form of a black brown solid. It is very soluble in water, alcohol, methanol, and ether. It has a specific gravity of 2.898 at 25°C and a melting point of about 300°C. Ferric chloride, anhydrous, analyzed reagent shall conform to the requirements as shown in Table XIX.

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Table XIX. - Chemical requirements for ferric chloride, anhydrous analyzed reagent

Property	Requirement
Assay, as $FeCl_3$ (min)	96.0
Maximum limits of impurities:	
Insoluble in HCl	1.0
Copper (Cu)	0.05
Iron (Fe)	0.01
Nitrate (NO_3)	0.01
Phosphate (PO_4)	0.03
Sulfates (SO_4)	0.01
Zinc (Zn)	0.05

5.20.3 Use data. Ferric chloride, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent.

5.20.4 Packaging data and labeling. Ferric chloride, anhydrous, analyzed reagent is packaged for military use in 1 lb unit quantity nonactinic bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, individual containers must bear the following precautionary label:

FERRIC CHLORIDE

WARNING! REACTS WITH WATER TO PRODUCE HAZARDOUS FUMES

Keep tightly closed. Store in a dry place.

5.20.5 Storage data. Ferric chloride, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. The shelf life of this chemical is approximately one year from date of manufacture.

5.21 Name. FERRIC SULFATE, HYDRATED, ANALYZED REAGENT

$Fe_2(SO_4)_3 \cdot xH_2O$ FW 399.90 + xH_2O

5.21.1 Specifications. None.

5.21.2 Technical description. Ferric sulfate, hydrated is in the form of a slightly yellowish, hygroscopic powder. It is slowly soluble in water and sparingly soluble in alcohol. The number of water molecules vary, hence there is no exact formula weight. Ferric sulfate, hydrated, analyzed reagent shall conform to the requirements shown in Table XX.

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Table XX. - Chemical requirements for ferric sulfate, hydrated, analyzed reagent

Property	Requirement
Maximum limits of impurities:	
Chloride (Cl)	0.002
Copper (Cu)	0.005
Ferrous Iron	0.02
Insoluble matter	0.020
Nitrate	0.01
Substances not ppt by ammonium hydroxide (as SO_4)	0.10
Zinc	0.005

5.21.3 Use data. Ferric sulfate, hydrated, analyzed reagent is intended for military use as a general laboratory reagent.

5.21.4 Packaging data and labeling. Ferric sulfate, hydrated, analyzed reagent is packaged for military use in 1/4 lb and 1 lb unit quantity nonactinic bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.21.5 Storage data. Ferric sulfate, hydrated, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. The shelf life of this chemical is approximately one year from date of manufacture.

5.22 Name. IODINE MONOCHLORIDE, REAGENT ICl FW 162.37
Iodine Chloride
(HAZARDOUS)

5.22.1 Specifications. None.

5.22.2 Technical description. Iodine monochloride exists in two solid forms, alpha and beta. It is in the form of a reddish-brown liquid or red crystals. It is soluble in alcohol, dilute hydrochloric acid, and water (with decomposition). It has a specific gravity of 3.78. Iodine monochloride, reagent shall be in the form of reddish-brown crystals, and have a melting point range of 26 - 28°C, and not be over 1 year old from date of manufacture.

5.22.3 Use data. Iodine monochloride, reagent is intended for military use as a general laboratory reagent.

5.22.4 Packaging data and labeling. Iodine monochloride, reagent, is packaged for military use in 100 gm unit quantity nonactinic bottles. It must be packaged in accordance with DoT regulations, and each shipping container must bear the DoT white label for corrosive liquids. In addition, each individual container must bear the following precautionary label:

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IODINE MONOCHLORIDE

DANGER! STRONG OXIDANT
POISONOUS IF SWALLOWED
EMITS POISONOUS GAS WHEN HEATED.

Keep away from heat, sparks, and open flames.
Do not breathe vapor; use only with adequate ventilation.
Avoid contact with skin, eyes, or clothing.
In case of contact, immediately remove all contaminated clothing and flush skin or eyes with plenty of water for at least 15 minutes.
Get medical attention. Wash clothing before reuse.

POISON!
CALL A PHYSICIAN

5.22.5 Storage data. Iodine monochloride, reagent should be stored in a cool, dry, well-ventilated place in tightly sealed containers. It should be stored away from heat, sparks, and open flames. Under these storage conditions the shelf life if approximately 1 year from date of manufacture.

5.23 Name. IODINE PENTOXIDE, ANALYZED REAGENT I_2O_5 FW 333.82
Iodic Acid, Anhydride
(HAZARDOUS)

5.23.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.23.2 Technical description. Iodine pentoxide is in the form of a white, crystalline powder. It is soluble in water and dilute alcohol. It is insoluble in absolue alcohol, chloroform, etner, and carbon disulfide. It has a specific gravity of 4.799 and a melting point of 300°C with decomposition. Iodine pentoxide, analyzed reagent shall conform to the requirements as shown in Table XXI.

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Table XXI. - Chemical requirements of iodine pentoxide, analyzed reagent

Property	Requirement
Assay, as I_2O_5 (min)	98.5
Maximum limits of impurities:	
Chloride (Cl)	0.020
Heavy metals (as Pb)	0.001
Insolubles	0.010
Iodide (I)	0.010
Iron (Fe)	0.002
Residue after ignition	0.050
Sulfate (SO_4)	0.010

5.23.3 Use data. Iodine pentoxide, analyzed reagent is intended for military use as a general laboratory reagent.

5.23.4 Packaging data and labeling. Iodine pentoxide, analyzed reagent, is packaged for military use in 1 oz or 25 g unit quantity nonactinic bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

IODINE PENTOXIDE

DANGER! STRONG OXIDANT
POISONOUS IF SWALLOWED
CAUSES SKIN IRRITATION
EMITS POISONOUS FUMES WHEN HEATED

Keep away from heat, sparks, and open flame.
Do not store with combustible material.
Avoid contact with skin, eyes, clothing.
In case of contact, immediately remove all contaminated clothing and flush skin or eyes with plenty of water for 15 minutes.
Get medical attention.

5.23.5 Storage data. Iodine pentoxide, analyzed reagent should be stored in a cool, dry, well-ventilated area in tightly sealed containers. It should be stored away from heat, sparks, open flame, and combustible material. Under these storage conditions, the shelf life is indefinite.

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5.24 Name. LANTHANUM NITRATE, REAGENT (HAZARDOUS) $La(NO_3)_3 \cdot 6H_2O$ FW 433.04

5.24.1 Specifications. None.

5.24.2 Technical description. Lanthanum nitrate is in the form of white, hygroscopic crystals. It is soluble in water, alcohol, and acids. It has a boiling point of 126°C and a melting point of 40°C.

5.24.3 Use data. Lanthanum nitrate, reagent is intended for military use as a general laboratory reagent.

5.24.4 Packaging data and labeling. Lanthanum nitrate, reagent is packaged for military use in 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT label for oxidizing materials. In addition each individual container must bear the following precautionary label:

LANTHANUM NITRATE

WARNING! STRONG OXIDANT
HARMFUL IF SWALLOWED

Wash thoroughly after handling.

5.24.5 Storage data. Lanthanum nitrate, reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.25 Name. LEAD OXIDE, RED, ANALYZED REAGENT (HAZARDOUS) Pb_3O_4 FW 685.63

5.25.1 Specifications. None.

5.25.2 Technical description. Lead oxide, red, is in the form of a bright red powder. It is insoluble in water and partly soluble in acids. It has a specific gravity of 8.32 - 9.16, and decomposes between 500 and 530°C. Lead oxide, red, analyzed reagent shall conform to the requirements of Edgewood Arsenal Purchase Description 4-164 as shown in Table XXII.

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Table XXII. - Chemical requirements for lead oxide, red, analyzed reagent

Property	Requirement
Assay, as Pb_3O_4 (min)	90
Maximum limits of impurities:	
Insoluble in nitric acid	0.3
Water soluble substances	0.3
Carbon compounds (asC)	0.005
Manganese (Mn)	0.0005

5.25.3 Use data. Lead oxide, red, analyzed reagent is intended for military use as a general laboratory reagent.

5.25.4 Packaging data and labeling. Lead oxide, red, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must have the following precautionary label:

LEAD OXIDE, RED

WARNING! HARMFUL DUST

Avoid breathing dust.
Wash thoroughly before eating or smoking
Keep away from food and food products.

5.25.5 Storage data. Lead oxide, red, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.26 Name. LITHIUM SULFATE, MONOHYDRATE, ANALYZED REAGENT
$Li_2SO_4 \cdot H_2O$ FW 127.96

5.26.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.26.2 Technical description. Lithium sulfate, monohydrate, is in the form of colorless crystals or white granules. It is soluble in water and insoluble in 80% alcohol. It has a specific gravity of 2.06, and a melting point of 130°C. Lithium sulfate, monohydrate, analyzed reagent shall conform to the requirements shown in Table XXIII.

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Table XXIII. - Chemical requirements for lithium sulfate, monohydrate analyzed reagent

Proprety	Requirement
Assay	99.0
Maximum limits of impurities:	
Insoluble matter	0.01
Chloride (Cl)	0.005
Heavy metals (as Pb)	0.001
Iron (Fe)	0.002
Nitrate (NO_3)	0.001
Other alkalies	0.5

5.26.3 Use data. Lithium sulfate, monohydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.26.4 Packaging data and labeling. Lithium sulfate, monohydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical,

5.26.5 Storage data. Lithium sulfate, monohydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.27 Name. MAGNESIUM CARBONATE, BASIC, TRIHYDRATE, ANALYZED REAGENT
Typical $Mg(OH)_2 \cdot 3MgCO_3 \cdot 3H_2O$

5.27.1 Specifications. None.

5.27.2 Technical description. Mangesium carbonate, basic is in the form of a very light, odorless, white powder. It is insoluble in water and alcohol and soluble in acids. It has a specific gravity of 3.04 and decomposes at 350°C. Various formulas for this compound are given and all may be possible, because of the method of derivation. A typical formula is shown above. Magnesium carbonate, basic, trihydrate, analyzed reagent shall conform to the requirements shown in Table XXIV.

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Table XXIV. - Typical properties of magnesium carbonate, basic, trihydrate, analyzed reagent

Property	Requirement
Assay, as MgO (min)	40.0
Maximum limits of impurities:	
Insoluble in hydrochloric acid	0.02
Chloride (Cl)	0.002
Nitrate (NO_3)	0.003
Sulfate and sulfite (as SO_4)	0.010
Water soluble substances	0.40
Calcium (Ca)	0.020
Heavy metals (as Pb)	0.001
Iron (Fe)	0.002

5.27.3 Use data. Magnesium carbonate, basic, trihydrate, analyzed reagent is intended for use as a general laboratory reagent.

5.27.4 Packaging data and labeling. Magnesium carbonate, basic, trihydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.27.5 Storage data. Magnesium carbonate, basic, trihydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. The shelf life is approximately 1 year from date of manufacture.

5.28 Name. MAGNESIUM IODIDE, OCTAHYDRATE, REAGENT $MgI_2.8H_2O$ FW 422.24

5.28.1 Specifications. None.

5.28.2 Technical description. Magnesium iodide, octahydrate is in the form of a white, deliquescent, crystalline powder. It is soluble in water, alcohol, and ether. It decomposes at 41°C.

5.28.3 Use data. Magnesium iodide, octahydrate, reagent is intended for military use as a general laboratory reagent.

5.28.4 Packaging data and labeling. Magnesium iodide, octahydrate, reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.28.5 Storage data. Magnesium iodide, octahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. The estimated shelf life is 1 year from date of manufacture.

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5.29 Name. MAGNESIUM PERCHLORATE, ANHYDROUS, ANALYZED REAGENT (HAZARDOUS) $Mg(ClO_4)_2$ FW 223.22

5.29.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.29.2 Technical description. Magnesium perchlorate, anhydrous, is in the form of white, crystalline, deliquescent powder. It is very soluble in water and alcohol. It has a specific gravity of 2.21 at 18°C and decomposes at 185-190°C. It is explosive when in contact with reducing materials. Magnesium perchlorate, anhydrous, analyzed reagent shall conform to the requirements shown in Table XXV.

Table XXV. - Chemical requirements for magnesium perchlorate, anhydrous, analyzed reagent

Property	Requirement
Maximum limits of impurities:	
Acidity ($HClO_4$)	0.05
Alkalinity (MgO)	0.05
Chloride (Cl)	0.02
Nitrate (NO_3)	0.02
Sulfate (SO_4)	0.25
Calcium (Ca)	0.15

5.29.3 Use data. Magnesium perchlorate, anhydrous, analyzed reagent is intended for use as a general laboratory reagent. It is primarily used as a dehydrating agent.

5.29.4 Packaging data and labeling. Magnesium perchlorate, anhydrous, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

MAGNESIUM PERCHLORATE

WARNING! STRONG OXIDANT
CAUSES SKIN IRRITATION
HARMFUL IF SWALLOWED

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Keep away from heat, sparks, and open flame.
Do not store with combustible materials.
Do not get on skin, in eyes, or on clothing.
In case of contact immediately flush skin or eyes with plenty of water for at least 15 minutes; for eyes, get medical attention.

5.29.5 Storage data. Magnesium perchlorate, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions the shelf life is indefinite.

5.30 Name. MAGNESIUM SULFATE, ANHYDROUS, ANALYZED REAGENT $MgSO_4$
FW 120.39

5.30.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.30.2 Technical description. Magnesium sulfate, anhydrous is in the form of small, colorless, needle-like crystals. It is very soluble in water, soluble in glycerol, and sparingly soluble in alcohol. It has a specific gravity of 2.65. Magnesium sulfate, anhydrous, analyzed reagent shall conform to the requirements shown in Table XXVI.

Table XXVI. - Chemical requirements for magnesium sulfate, anhydrous, analyzed reagent

Property	Requirement
Assay	98.0
Maximum limits of impurities:	
Calcium (Ca)	0.20
Chloride (Cl)	0.002
Heavy metals (as Pb)	0.001
Insoluble in hydrochloric acid	0.015
Iron (Fe)	0.002
Nitrate (NO_3)	0.003
Sulfate (SO_4)	0.01

5.30.3 Use data. Magnesium sulfate, anhydrous, analyzed reagent is intended for use as a general laboratory reagent.

5.30.4 Packaging data and labeling. Magnesium sulfate, anhydrous, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

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5.30.5 Storage data. Magnesium sulfate, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.31 Name. MANGANESE DIOXIDE, ANALYZED REAGENT MnO_2 FW 86.94
Manganese Binoxide
(HAZARDOUS)

5.31.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.31.2 Technical description. Manganese dioxide is in the form of a black crystalline or amphorous powder. It is insoluble in water but soluble in hydrochloric acid. It has a specific gravity of 5.026 and a melting point of 535°C with decomposition. Manganese dioxide, analyzed reagent shall conform to the requirements shown in Table XXVII.

Table XXVII. - Chemical requirements for manganese dioxide, analyzed reagent

Property	Requirement
Assay, as MnO_2 (min)	99.5
Maximum limits of impurities:	
Alkalies and alkaline earths	0.20
Chloride (Cl)	0.010
Insoluble matter	0.03
Iron (Fe)	0.05
Nitrate (NO_3)	0.05
Sulfate (SO_4)	0.05

5.31.3 Use data. Manganese dioxide, analyzed reagent is intended for military use as a general laboratory reagent.

5.31.4 Packaging data and labeling. Manganese dioxide, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition each individual container must bear the following precautionary label:

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MANGANESE DIOXIDE
CAUTION! STRONG OXIDANT
HARMFUL IF SWALLOWED
HAZARDOUS DUST

Keep away from heat and open flame.
Do not store with combustible materials.

5.31.5 Storage data. Manganese dioxide, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions, the shelf life is indefinite.

5.32 Name. MANGANOUS CHLORIDE, TETRAHYDRATE, ANALYZED REAGENT
Manganese Chloride $MnCl_2.4H_2O$ FW 197.91

5.32.1 Specifications. MIL-M-51271, Manganous Chloride, Tetrahydrate, Analyzed Reagent.

5.32.2 Technical description. Manganous chloride, tetrahydrate is in the form of deliquescent rose-colored crystals. It is very soluble in water, slightly soluble in alcohol, and insoluble in ether. It has a specific gravity of 1.913 and a melting point of 87.5°C. It loses one water of hydration at 106°C. Manganous chloride, tetrahydrate, analyzed reagent shall conform to the requirements shown in Table XXVIII.

Table XXVIII. - Chemical requirements for manganous chloride, tetrahydrate, analyzed reagent

Property	Requirement
Assay, as $MnCl_2.4H_2O$ (min)	99.0
Maximum limits of impurities:	
Insoluble matter	0.010
Sulfate (SO_4)	0.005
Substances not ppt. by ammonium sulfide (as SO_4)	0.20
Iron (Fe)	0.001
Heavy metals (as Pb)	0.001

5.32.3 Use data. Manganous chloride, tetrahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.32.4 Packaging data and labeling. Manganous chloride, tetrahydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

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5.32.5 Storage data. Manganous chloride, tetrahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. The shelf life is approximately 1 year from date of manufacture.

5.33 Name. MERCURIC CYANIDE, ANALYZED REAGENT $Hg(CN)_2$ FW 252.63
Mercury Cyanide
(HAZARDOUS)

5.33.1 Specifications. None.

5.33.2 Technical description. Mercuric cyanide is in the form of colorless transparent prisms or white powder. It is soluble in water, alcohol, ammonium hydroxide, and alkali cyanide solutions. It has a specific gravity of 3.996.

Table XXIX. - Typical properties of mercuric cyanide, analyzed reagent

Property	Requirement
Assay, as $Hg(CN)_2$ (min)	99.0
Maximum limits of impurities:	
Insoluble in alcohol	0.020
Residue after ignition	0.020
Chloride (Cl)	0.010
Sulfate (SO_4)	0.010
Iron (Fe)	0.001

5.33.3 Use data. Mercuric cyanide, analyzed reagent is intended for military use as a general laboratory reagent.

5.33.4 Packaging data and labeling. Mercuric cyanide, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.370 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT poison label for Class B poisons. In addition, each individual container must bear the following precautionary label:

MERCURIC CYANIDE

DANGER! POISONOUS SOLID
CONTACT WITH ACID LIBERATES POISONOUS GAS

Do not breathe gas or dust.
Do not take internally.
Wash thoroughly after handling.

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Keep container closed and away from acids. Store in a dry place.
In case of contact with eyes, flush with plenty of water for at least 15 minutes and get medical attention.

5.33.5 Storage data. Mercuric cyanide, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.34 Name. MERCURIC NITRATE, MONOHYDRATE, ANALYZED REAGENT
Mercury Nitrate $Hg(NO_3)_2.H_2O$ FW 342.62
(HAZARDOUS)

5.34.1 Specifications. MIL-M-51273, Mercuric Nitrate, Monohydrate, Analyzed Reagent.

5.34.2 Technical description. Mercuric nitrate, monohydrate, is in the form of colorless crystals or white deliquescent powder. It is soluble in water and insoluble in alcohol. It has a specific gravity of 4.3 and a melting point of 79°C. Mercuric nitrate, monohydrate, analyzed reagent shall conform to the requirements shown in Table XXX.

Table XXX. - Physical and chemical requirements for mercuric nitrate, monohydrate, analyzed reagent

Property	Requirement
Color	White
Form	Granular powder
Assay, as $Hg(NO_3)_2.H_2O$ (min)	99.0
Maximum limits of impurities:	
Residue after ignition	0.020
Chloride (Cl)	0.005
Sulfate (SO_4)	0.010
Iron (Fe)	0.001
Foreign metals (as Pb)	0.002
Mercurous mercury (as Hg)	0.15

5.34.3 Use data. Mercuric nitrate, monohydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.34.4 Packaging data and labeling. Mercuric nitrate, monohydrate, analyzed reagent is packaged for military use in 1/4 lb and 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials.

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In addition each individual container must bear the following precautionary label:

MERCURIC NITRATE

DANGER! STRONG OXIDANT
CAUSES SEVERE SKIN IRRITATION
POISONOUS IF SWALLOWED

Do not get in eyes, on skin, or on clothing.
Wash thoroughly after handling.
Keep away from heat and open flame.
Do not store with combustible materials.

5.34.5 Storage data. Mercuric nitrate, monohydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from heat and combustible materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.35 Name. MERCUROUS NITRATE, MONOHYDRATE, ANALYZED REAGENT (HAZARDOUS) $HgNO_3 \cdot H_2O$ FW 280.63

5.35.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.35.2 Technical description. Mercurous nitrate is in the form of short prismatic crystals. It effloresces and becomes anhydrous in dry air. It is sensitive to light. It is soluble in small quantities of warm water, and hydrolyzes in larger quantities. It has a specific gravity of 4.785 at 3.9°C and a melting point of 70°C. Mercurous nitrate, monohydrate, analyzed reagent shall conform to the requirements shown in Table XXXI.

Table XXXI. - Chemical requirements of mercurous nitrate, monohydrate, analyzed reagent

Property	Requirement
Assay, as $HgNO_3 \cdot H_2O$	98.0
Maximum limits of impurities:	
Chloride (Cl)	0.005
Insoluble matter	0.005
Iron (Fe)	0.001
Mercuric salt (as Hg)	0.5
Residue after ignition	.005
Sulfate (SO_4)	.010

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5.35.3 Use data. Mercurous nitrate, monohydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.35.4 Packaging data and labeling. Mercurous nitrate, monohydrate, analyzed reagent is packaged for military use in 1/4 lb and 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.364 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT poison label for Class B poisons. In addition, each individual container must bear the following precautionary label:

MERCUROUS NITRATE

DANGER! STRONG OXIDANT
CAUSES SEVERE SKIN IRRITATION
POISONOUS IF SWALLOWED

Do not get in eyes, on skin, or on clothing
Wash thoroughly after handling.
Keep away from heat and open flame.
Do not store with combustible materials.

5.35.5 Storage data. Mercurous nitrate, monohydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from heat and combustible materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.36 Name. NICKEL CHLORIDE, HEXAHYDRATE, ANALYZED REAGENT $NiCl_2.6H_2O$
FW 237.72

5.36.1 Specifications. None.

5.36.2 Technical description. Nickel chloride, hexahydrate is in the form of green crystalline granules. It is deliquescent in moist air. It is soluble in water, alcohol, and ammonium hydroxide. Nickel chloride, hexahydrate, analyzed reagent shall conform to the requirements of Edgewood Arsenal Purchase Description 4-183 as shown in Table XXXII.

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Table XXXII. - Chemical requirements for nickel, chloride, hexahydrate, analyzed reagent

Property	Requirement
Assay, as $NiCl_2.6H_2O$ (min)	99.0
Maximum limits of impurities:	
Cobalt	0.20
Copper	0.020
Insoluble matter (in hydrochloric acid)	0.010
Iron (Fe)	0.010
Lead (Pb)	0.005
Alkalies and alkaline earths	0.20
Nitrate (NO_3)	0.008
Sulfate (SO_4)	0.010
Zinc (Zn)	0.05

5.36.3 Use data. Nickel chloride, hexahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.36.4 Packaging data and labeling. Nickel chloride, hexahydrate, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.36.5 Storage data. Nickel chloride, hexahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. The shelf life is approximately 1 year from date of manufacture.

5.37 Name. NICKEL NITRATE, HEXAHYDRATE, ANALYZED REAGENT (HAZARDOUS) $Ni(NO_3)_2.6H_2O$ FW 290.82

5.37.1 Specifications. None.

5.37.2 Technical description. Nickel nitrate, hexahydrate is in the form of green, deliquescent crystals. It is soluble in water, alcohol, and ammonium hydroxide. It has a specific gravity of 2.065, melting point of 56.7°C, and a boiling point of 136.7°C. Nickel nitrate, hexahydrate, analyzed reagent shall conform to the requirements of Edgewood Arsenal Purchase Description 4-190 as shown in Table XXXIII.

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Table XXXIII. - Chemical requirements for nickel nitrate, hexahydrate, analyzed reagent

Property	Requirement
Assay, as $Ni(NO_3)_2.6H_2O$ (min)	98
Maximum limits of impurities:	
Insoluble nitric acid	0.010
Chloride	0.002
Sulfate	0.010
Alkalies and alkaline earths	0.20
Cobalt (Co)	0.10
Copper (Cu)	.020
Iron (Fe)	.010
Lead (Pb)	.005
Zinc (Zn)	.05

5.37.3 Use data. Nickel nitrate, hexahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.37.4 Packaging data and labeling. Nickel nitrate, hexahydrate, analyzed reagent is packaged for military use in 1/4 lb and 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

NICKEL NITRATE

CAUTION! STRONG OXIDANT
HARMFUL IF SWALLOWED

Wash thoroughly after handling.
Store separately from and avoid contact with combustible materials.

5.37.5 Storage data. Nickel nitrate, hexahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from heat and combustible materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

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5.38 Name. PALLADIUM CHLORIDE, ANHYDROUS, REAGENT $PdCl_2$ FW 177.31

5.38.1 Specifications. MIL-P-51272, Palladium Chloride, Anhydrous, Reagent.

5.38.2 Technical description. Palladium chloride, anhydrous is in the form of a dark brown deliquescent powder or crystals. It is soluble in water, hydrochloric acid, alcohol, and acetone. It has a melting point of 501°C with decomposition. Palladium chloride, anhydrous, reagent shall be a dark brown powder and contain no less than 59.4% by weight of palladium (Pd).

5.38.3 Use data. Palladium chloride, anhydrous, reagent is intended for military use as a general laboratory reagent.

5.38.4 Packaging data and labeling. Palladium chloride, anhydrous, reagent is packaged for military use in 10 gm unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.28.5 Storage data. Palladium chloride, anhydrous, reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.39 Name. PALLADIUM SULFATE, DIHYDRATE, REAGENT $PdSO_4.2H_2O$ FW 238.50

5.39.1 Specifications. None.

5.39.2 Technical description. Palladium sulfate, dihydrate in is the form of deliquescent, reddish-brown crystals. It is readily soluble in cold water, but decomposes in hot water. It shall contain a minimum of 99.0% by weight of $PdSO_4.2H_2O$.

5.39.3 Use data. Palladium sulfate, dihydrate, reagent is intended for military use as a general laboratory reagent.

5.39.4 Packaging data and labeling. Palladium sulfate, dihydrate, reagent is packaged for military use in 1 oz unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.39.5 Storage data. Palladium sulfate, dihydrate, reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

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5.41.5 Storage data. Phosphorous pentachloride, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.42 Name. PHOSPHOROUS TRICHLORIDE, ANALYZED REAGENT (HAZARDOUS) PCl_3 FW 137.33

5.42.1 Specifications. None.

5.42.2 Technical description. Phosphorous trichloride is a clear, colorless fuming liquid. It decomposes rapidly in moist air. It is soluble in benzene, ether, carbon tetrachloride, and carbon disulfide. Phosphorous trichloride, analyzed reagent shall conform to the requirements of Edgewood Arsenal Purchase Description 4-192, as shown in Table XXXVI.

Table XXXVI. - Physical and chemical requirements for phosphorous trichloride, analyzed reagent

Property	Requirement
Color	Clear and colorless
Form	Fuming liquid
Boiling range	75 - 78°C
Specific gravity	1.57 ± .03
Maximum limits of impurities:	
Sulfate (SO_4)	0.02
Heavy metals (as Pb)	0.002
Iron (Fe)	0.005

5.42.3 Use data. Phosphorous trichloride, analyzed reagent is intended for military use as a general laboratory reagent.

5.42.4 Packaging data and labeling. Phosphorous trichloride, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. Each shipping container must bear the DoT white label for corrosive liquids. In addition, each individual container must bear the following precautionary label:

PHOSPHOROUS TRICHLORIDE

DANGER! CAUSES SEVERE BURNS
VAPOR EXTREMELY IRRITATING
CONTACT WITH WATER MAY CAUSE FLASH FIRE

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Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
In case of contact, immediately remove all contaminated clothing and flush skin or eyes with plenty of water for at least 15 minutes; for eyes, get medical attention. Wash clothing before reuse.
In case of spillage, flood carefully with LARGE VOLUME of water, and provide adequate ventilation.
Do not add water to contents while in a container because of violent reaction and possible flash fire.
Do not clean or re-use this container.

5.42.5 Storage data. Phosphorous trichloride, analyzed reagent should be stored in a cool, dry, well-ventilated area in tightly sealed containers. It should be stored away from other materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.43 Name. POTASSIUM ARSENATE, MONOBASIC, ANALYZED REAGENT (HAZARDOUS) KH_2AsO_4 FW 180.03

5.43.1 Specifications. None.

5.43.2 Technical description. Potassium arsenate is in the form of colorless crystals. It is soluble in water and insoluble in alcohol. It has a specific gravity of 2.867 and a melting point of 288°C.

Table XXXVII. Typical properties of potassium arsenate, analyzed reagent

Maximum limits of impurities:	
Arsenite	0.010
Chloride (Cl)	0.005
Iron (Fe)	0.005
Nitrate (NO_3)	0.020
Sulfate (SO_4)	0.080

5.43.3 Use data. Potassium arsenate, monobasic, analyzed reagent is intended for military use as a general laboratory reagent.

5.43.4 Packaging data and labeling. Potassium arsenate, monobasic, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.364 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT poison label for Class B poisons.

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In addition, each individual container must bear the following precautionary label:

POTASSIUM ARSENATE

DANGER! MAY BE FATAL IF SWALLOWED
MAY CAUSE SKIN IRRITATION

Avoid prolonged or repeated contact with skin.
Wash thoroughly after handling.

POISON
CALL A PHYSICIAN

5.43.5 Storage data. Potassium arsenate, monobasic, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.44 Name. POTASSIUM BI-IODATE, ANALYZED REAGENT (HAZARDOUS) $KH(IO_3)_2$ FW 389.92

5.44.1 Specifications. MIL-P-51267, Potassium Bi-iodate, Analyzed Reagent.

5.44.2 Technical description. Potassium bi-iodate is in the form of white or colorless crystals. Potassium bi-iodate, analyzed reagent shall conform to the requirements shown in Table XXXVIII.

Table XXXVIII. - Chemical requirements for potassium bi-iodate, analyzed reagent

Property	Requirement
Maximum limits of impurities:	
Insoluble matter	0.005
Chloride and bromide (as Cl)	0.020
Nitrogen compounds (as N)	0.003
Sulfate (SO_4)	0.005
Heavy metals (as Pb)	0.0005
Iron (Fe)	0.001

5.44.3 Use data. Potassium bi-iodate, analyzed reagent is intended for military use as a general laboratory reagent.

5.44.4 Packaging data and labeling. Potassium bi-iodate, analyzed

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reagent is packaged for military use in 1/4 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

POTASSIUM BI-IODATE

CAUTION! STRONG OXIDANT
WHEN HEATED RELEASES HAZARDOUS FUMES

Use with adequate ventilation.
Store separately from and avoid contact with combustible material.

5.44.5 Storage data. Potassium bi-iodate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.45 Name. POTASSIUM CYANIDE, REAGENT (HAZARDOUS) KCN FW65.12

5.45.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.45.2 Technical description. Potassium cyanide is in the form of deliquescent, white, amorphous lumps or crystals. It has a faint odor of bitter almonds. It is soluble in water, alcohol, and glycerol. It has a specific gravity of 1.52 at 16°C and a melting point of 634.5°C. Potassium cyanide, reagent shall conform to the requirements shown in Table XXXIX.

Table XXXIX. - Chemical requirements for potassium cyanide reagent

Property	Requirement
Assay, as KCN (min)	96.0
Maximum limits of impurities:	
Lead (Pb)	0.0002
Chloride (Cl)	0.5
Iron (Fe)	0.03
Sodium (Na)	0.5
Sulfate (SO_4)	0.04
Sulfide (as S)	0.003
Thiocyanate	0.02

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5.45.3 Use data. Potassium cyanide, reagent is intended for military use as a general laboratory reagent. It is also used for electroplating.

5.45.4 Packaging data and labeling. Potassium cyanide, reagent is packaged for military use in 25 lb unit quantity polyethylene lined fiber drums. Unless otherwise exempt under the provisions of section 173.370 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT poison label for Class B poisons. In addition, each individual container must bear the following precautionary label:

POTASSIUM CYANIDE

DANGER! POISONOUS SOLID
CONTACT WITH ACID LIBERATES POISONOUS GAS

Do not breathe gas or dust.
Do not take internally.
Avoid contact with eyes and skin.
Wash thoroughly after handling.
Keep container closed and away from acids. Store in a dry place.
Keep away from feed and foodstuffs.
In case of contact with eyes, flush with plenty of water for at least 15 minutes and get medical attention.

POISON
CALL A PHYSICIAN

5.45.5 Storage data. Potassium cyanide, reagent should be stored in a cool, dry, well-ventilated place in tightly sealed containers. It should be stored away from acids and protected from direct sunlight. Under these storage conditions, the shelf life is indefinite.

5.46 Name. POTASSIUM FLUORIDE, DIHYDRATE, ANALYZED REAGENT $KF.2H_2O$
(HAZARDOUS) FW 94.13

5.46.1 Specifications. None.

5.46.2 Technical description. Potassium fluoride, dihydrate is in the form of a white, crystalline, deliquescent powder. It is soluble in water and hydrofluoric acid, and insoluble in alcohol. It has a specific gravity of 2.454 and a melting point of 41°C.

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TABLE XL. - Typical properties of potassium fluoride, dihydrate, analyzed reagent

Properties	Requirement
Assay, as $KF.2H_2O$ (min)	98.0
Maximum limits of impurities:	
Chloride (Cl)	0.010
Free acid (as hydrofluoric acid)	0.10
Free Alkali (as potassium carbonate)	0.170
Heavy metals (as Pb)	0.003
Insoluble matter	0.040
Iron (Fe)	0.003
Silicofluoride	0.270
Sodium (Na)	0.020
Sulfate (SO_4)	0.020
Sulfite (SO_2)	0.005

5.46.3 Use data. Potassium fluoride, dihydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.46.4 Packaging data and labeling. Potassium fluoride, dihydrate, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must bear the following precautionary label:

POTASSIUM FLUORIDE

CAUTION! HARMFUL IF SWALLOWED
MAY CAUSE IRRITATION OF SKIN, EYES, NOSE AND THROAT.

Wash thoroughly after handling.

5.46.5 Storage data. Potassium fluoride, dihydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions the shelf life is indefinite.

5.47 Name. POTASSIUM PERSULFATE, ANALYZED REAGENT (HAZARDOUS) $K_2S_2O_8$ FW 270.33

5.47.1 Specifications. MIL-P-51268, Potassium Persulfate, Analyzed Reagent.

5.47.2 Technical description. Potassium persulfate is in the form of white crystals. It is soluble in water and insoluble in alcohol. It has a specific gravity of 2.477 and decomposes below 100°C. Potassium persulfate, analyzed reagent shall conform to the requirements as shown in Table XLI.

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Table XLI. - Chemical requirements for potassium persulfate, analyzed reagent

Property	Requirement
Assay, as $K_2S_2O_8$ (min)	99.0
Maximum limits of impurities:	
Chlorine compounds (as Cl)	0.001
Nitrogen compounds (as N)	0.005
Heavy metals (as Pb)	0.001
Iron (Fe)	0.001
Manganese (Mn)	0.0002
Insoluble matter	0.005

5.47.3 Use data. Potassium persulfate, analyzed reagent is intended for military use as a general laboratory reagent. It is used as a reagent for the micro-Kjeldahl apparatus for nitrogen determination.

5.47.4 Packaging data and labeling. Potassium persulfate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must bear the following precautionary label:

POTASSIUM PERSULFATE

CAUSE! MAY CAUSE IRRITATION OF SKIN, EYES, NOSE AND THROAT
HARMFUL IF SWALLOWED
HEATING PRODUCES HAZARDOUS FUMES

Do not get on skin, in eyes, or on clothing.
Wash thoroughly after handling.
In case of contact, flush eyes with water for at least 15 minutes.

5.47.5 Storage data. Potassium persulfate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under the storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.48 Name. POTASSIUM PHOSPHATE, DIBASIC, ANHYDROUS, ANALYZED REAGENT
K_2HPO_4 FW 174.18
Potassium Hydrogen Phosphate

5.48.1 Specifications. MIL-P-36248, Potassium Phosphate, Dibasic, Anhydrous, Analyzed Reagent, 1/4 lb (113.4 gm)

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5.48.2 Technical description. Potassium phosphate, dibasic is in the form of white, deliquescent crystals or powder. It is very soluble in water and alcohol. Potassium phosphate, dibasic, anhydrous, analyzed reagent shall conform to the requirements shown in Table XLII.

Table XLII. - Physical and chemical requirements for potassium phosphate, dibasic, anhydrous, analyzed reagent

Property	Requirement
Color	white
Form	powder
Assay, as K_2HPO_4 (min)	98.0
Maximum limits of impurities:	
Insoluble matter	0.02
Ammonium (NH_4)	0.01
Arsenic (as As_2O_3)	0.001
Chloride (Cl)	0.01
Heavy metals (as Pb)	0.002
Nitrate (NO_3)	0.005
Sodium (Na)	0.02
Sulfate (SO_4)	0.08

5.48.3 Use data. Potassium phosphate, dibasic, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent.

5.48.4 Packaging data and labeling. Potassium phosphate, dibasic, anhydrous, analyzed reagent is packaged for military use in 1/4 lb (113.4 gm) average weight unit quantity bottles. No one immediate container shall contain less than 107.7 gm. There are no applicable DoT packaging or shipping regulations for this chemical.

5.48.5 Storage data. Potassium phosphate, dibasic, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.49 Name. POTASSIUM PYROANTIMONATE, ANALYZED REAGENT (HAZARDOUS) $K_2H_2Sb_2O_7 \cdot 4H_2O$ FW 507.78

5.49.1 Specifications. MIL-P-1160, Potassium Antimonate, Pyro, Reagent

5.49.2 Technical description. Potassium pyroantimonate is in the form of a white crystalline powder or granules. It is slightly soluble in cold water, readily soluble in hot water, and insoluble in alcohol. Potassium pyroantimonate, analyzed reagent shall be in the form of a white powder and shall meet the chemical requirements as established in paragraph 4.4.2 of cited specification.

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5.49.3 Use data. Potassium pyroantimonate, analyzed reagent is intended for military use as a general laboratory reagent. It is used as a reagent for sodium.

5.49.4 Packaging data and labeling. Potassium pyroantimonate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must bear the following precautionary label:

POTASSIUM PYROANTIMONATE

DANGER! MAY BE FATAL IF SWALLOWED
MAY CAUSE SKIN IRRITATION

Wash thoroughly after handling.

POISON
CALL A PHYSICIAN

5.49.5 Storage data. Potassium pyroantimonate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.50 Name. POTASSIUM TELLURITE, ANALYZED REAGENT (HAZARDOUS) K_2TeO_3 FW 253.81

5.50.1 Specifications. None.

5.50.2 Technical description. Potassium tellurite is in the form of a hygroscopic, granular, white powder. It is soluble in water. It decomposes at 460 - 470°C.

Table XLIII. - Typical properties of potassium tellurite, analyzed reagent

Assay, as K_2TeO_3 (min)	96.0
Maximum limits of impurities:	
Chloride (Cl)	0.01
Nitrate (NO_3)	0.01
Sulfate (SO_4)	to pass test

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5.50.3 Use data. Potassium tellurite, analyzed reagent is intended for military use as a general laboratory reagent. It is used in testing for bacteria.

5.50.4 Packaging data and labeling. Potassium tellurite, analyzed reagent is packaged for military use in 10 gm quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must bear the following precautionary label:

POTASSIUM TELLURITE

WARNING! HARMFUL IF INHALED OR SWALLOWED
HEATING RELEASES TOXIC FUMES.

Wash thoroughly before eating or smoking.

5.50.5 Storage data. Potassium tellurite, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.51 Name. SILVER CARBONATE, ANALYZED REAGENT Ag_2CO_3 FW 275.77

5.51.1 Specifications. None.

5.51.2 Technical description. Silver carbonate is in the form of a yellow to yellowish-gray, crystalline powder. It is insoluble in water and alcohol, but soluble in ammonium hydroxide and nitric acid. It has a specific gravity of 6.077 and decomposes at 218°C.

Table XLIV. - Typical properites of silver carbonate, analyzed reagent

Assay, as Ag_2CO_3 (min)	99.0
Maximum limits of impurities:	
Chloride (Cl)	0.005
Nitrate (NO_3)	0.05
Substances not ppt by hydrochloric acid	0.005
Sulfate (SO_4)	0.005

5.51.3 Use data. Silver carbonate, analyzed reagent is intended for military use as a general laboratory reagent.

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5.51.4 Packaging data and labeling. Silver carbonate, analyzed reagent is packaged for military use in 50 gm unit quantity nonactinic bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.51.5 Storage data. Silver carbonate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from direct sunlight as this material is light sensitive. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.52 Name. SILVER CYANIDE, REAGENT (HAZARDOUS) AgCN FW 133.90

5.52.1 Specifications. None.

5.52.2 Technical description. Silver cyanide is in the form of a white crystalline powder which darkens on exposure to light. It is insoluble in water, but soluble in ammonium hydroxide and potassium cyanide and sodium thiosulfate solutions. It has a specific gravity of 3.95 and decomposes at 320°C. Silver cyanide, reagent shall contain a minimum of 80.5 percent silver by weight.

5.52.3 Use data. Silver cyanide, reagent is intended for military use as a general laboratory reagent.

5.52.4 Packaging data and labeling. Silver cyanide, reagent, is packaged for military use in 100 oz unit quantity nonactinic bottles. Unless otherwise exempt under the provisions of section 173.370 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT poison label for Class B poisons. In addition, each individual container must bear the following precautionary label:

SILVER CYANIDE

DANGER! POISONOUS SOLID
CONTACT WITH ACID LIBERATES POISONOUS GAS

Do not breathe gas or dust.
Do not take internally.
Avoid contact with eyes and skin.
Wash thoroughly after handling.
Keep container closed and away from acids. Store in a dry place.
Keep away from feed or foodstuffs.
In case of contact with eyes, flush with plenty of water for at least 15 minutes and get medical attention.

POISON
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5.52.5 Storage data. Silver cyanide, reagent should be stored in a cool, dry place in tightly sealed containers. It should be protected from light. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.53 Name. SILVER IODATE, ANALYZED REAGENT (HAZARDOUS) $AgIO_3$ FW 282.79

5.53.1 Specifications. None.

5.53.2 Technical description. Silver iodate is in the form of a white powder. It is slightly soluble in water, and soluble in ammonium hydroxide and nitric acid. It is decomposed by sulfuric acid. It has a specific gravity of 5.65, and a melting point above 200°C.

Table XLV. - Typical properties of silver iodate, analyzed reagent

Maximum limits of impurities:	
Insoluble in ammonium hydroxide	0.050
Nitrogen compounds (as N)	0.001

5.53.3 Use data. Silver iodate, analyzed reagent is intended for military use as a general laboratory reagent. It is used as a reagent for the determination of biological chlorides.

5.53.4 Packaging data and labeling. Silver iodate, analyzed reagent, is packaged for military use in 50 gm unit quantity nonactinic bottles. Unless exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

SILVER IODATE

CAUTION! STRONG OXIDANT
HEATING PRODUCES TOXIC FUMES

Store separately from and avoid contact with combustible materials.

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5.53.5 Storage data. Silver iodate, analyzed reagent, should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials, and should be protected from light. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.54 Name. SILVER PERCHLORATE, ANHYDROUS, REAGENT (HAZARDOUS) $AgClO_4$ FW 207.32

5.54.1 Specifications. None.

5.54.2 Technical description. Silver perchlorate is in the form of white deliquescent crystals. It is soluble in water and slightly soluble in alcohol. It has a specific gravity of 2.806 at 25°C and decomposes at 486°C.

5.54.3 Use data. Silver perchlorate, anhydrous, reagent is intended for military use as a general laboratory reagent.

5.54.4 Packaging data and labeling. Silver perchlorate, anhydrous, reagent is packaged for military use in 1/4 lb unit quantity nonactinic bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT yellow label for flammable materials. In addition, each individual container must bear the following precautionary label:

SILVER PERCHLORATE

WARNING! STRONG OXIDANT
HARMFUL IF SWALLOWED
MAY CAUSE IRRITATION OF SKIN, EYES, NOSE, AND THROAT

Store separately from and avoid contact with combustible materials.
Keep away from heat, sparks, and open flame.
Wash thoroughly after handling.

5.54.5 Storage data. Silver perchlorate, anhydrous, reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.55 Name. SODIUM ARSENATE, DIBASIC, HEPTAHYDRATE, ANALYZED REAGENT (HAZARDOUS) $Na_2HAsO_4 \cdot 7H_2O$ FW 312.01

5.55.1 Specifications. None.

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5.55.2 Technical description. Sodium arsenate, dibasic, heptahydrate is in the form of clear, colorless crystals. It is soluble in water, slightly soluble in alcohol and glycerol, and insoluble in ether. It has a specific gravity of 1.871 and a melting point of 125°C. Sodium arsenate, dibasic, heptahydrate, analyzed reagent shall conform to the requirements of Edgewood Arsenal Purchase Description 4-187 as shown in Table XLVI.

Table XLVI. - Chemical and physical requirements for sodium arsenate dibasic, heptahydrate, analyzed reagent

Property	Requirement
Color	Colorless
Form	Crystals
Moisture (min)	38
Assay on dehydration, as Na_2HAsO_4 (min)	99
Maximum limits of impurities:	
Insolubles	0.005
Arsenite (A_2O_3)	0.003
Chloride (CI)	0.005
Nitrate (NO_3)	0.005
Sulfate (SO_4)	0.015
Heavy metals and iron	0.004

5.55.3 Use data. Sodium arsenate, dibasic, heptahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.55.4 Packaging data and labeling. Sodium arsenate, dibasic, heptahydrate, analyzed reagent is packaged for military use in 1/4 lb at 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.364 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT poison label for Class B poisons. In addition, each individual container must bear the following precautionary label:

SODIUM ARSENATE

DANGER! MAY BE FATAL IF SWALLOWED
MAY CAUSE SKIN IRRITATION

Avoid prolonged or repeated contact with skin.
Wash thoroughly after handling.

POISON
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5.55.5 Storage data. Sodium arsenate, dibasic, heptahydrate, analyzed shall be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.56 Name. SODIUM ARSENITE, ANALYZED REAGENT (HAZARDOUS) $NaAsO_2$ FW 129.90

5.56.1 Specifications. None.

5.56.2 Technical description. Sodium arsenite is in the form of a grayish white powder. It is very soluble in water, and slightly soluble in alcohol. It absorbs carbon dioxide from the air. It has a specific gravity of 1.87. Sodium arsenite, analyzed reagent shall conform to the requirements of Military Medical Purchase Description 4 as shown in Table XLVII.

Table XLVII. - Chemical requirements for sodium arsenite, analyzed reagent

Property	Requirement
Assay, as $NaAsO_2$ (min)	95.0
Maximum limits of impurities:	
Insoluble	0.01
Carbonate (CO_3)	0.15
Chloride (Cl)	0.005
Sulfate (SO_4)	0.02
Antimony (Sb)	0.05
Lead (Pb) approx.	0.03

5.56.3 Use data. Sodium arsenite, analyzed reagent is intended for military use as a general laboratory reagent.

5.56.4 Packaging data and labeling. Sodium arsenite, analyzed reagent is packaged for military use in 1/4 lb (113.4 gm) unit quantity bottles. Unless otherwise exempt under the provisions of section 173.314 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT poison label for Class B poisons. In addition, each individual container must bear the following precautionary label:

SODIUM ARSENITE

DANGER! MAY BE FATAL IF SWALLOWED
MAY CAUSE SKIN IRRITATION

Avoid prolonged or repeated contact with skin.
Wash thoroughly after handling.

POISON
CALL A PHYSICIAN

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5.56.5 Storage data. Sodium arsenite, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.57 Name. SODIUM BISULFATE, MONOHYDRATE, ANALYZED REAGENT
Sodium Acid Sulfate $NaHSO_4 \cdot H_2O$ FW 138.08

5.57.1 Specifications. MIL-S-51266, Sodium Bisulfate, Monohydrate, Analyzed Reagent.

5.57.2 Technical description. Sodium bisulfate is in the form of colorless crystals. It is soluble in water. The aqueous solution is strongly acid. It has a specific gravity of 2.103 at 13°C and a melting point of 58.5°C. Sodium bisulfate, monohydrate, analyzed reagent shall conform to the requirements as shown in Table XLVIII.

Table XLVIII. - Chemical requirements for sodium bisulfate, monohydrate, analyzed reagent

Property	Requirement
Acidity, as H_2SO_4	35.0 - 36.5
Maximum limits of impurities:	
Insoluble matter and ammonium hydroxide ppt.	0.010
Chloride (Cl)	0.002
Phosphate (PO_4)	0.002
Arsenic (As)	0.0001
Calcium and magnesium ppt	0.005
Heavy metals (as Pb)	0.0005
Iron (Fe)	0.001

5.57.3 Use data. Sodium bisulfate, monohydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.57.4 Packaging data and labeling. Sodium bisulfate, monohydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.57.5 Storage data. Sodium bisulfate, monohydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

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5.58 Name. SODIUM BISULFITE, ANALYZED REAGENT $NaHSO_3$ FW 104.06
Sodium Acid Sulfite

5.58.1 Specifications. MIL-S-51265, Sodium Bisulfite, Analyzed Reagent.

5.58.2 Technical description. Sodium bisulfite is in the form of white crystals or crystalline powder with a slight sulfurous odor. It is soluble in water and insoluble in alcohol. It is unstable in air. It has a specific gravity of 1.48. Sodium bisulfite, analyzed reagent shall conform to the requirements as shown in Table XLIX.

Table XLIX. - Chemical requirements for sodium bisulfite, analyzed reagent

Property	Requirement
Assay, as $NaHSO_3$ (min)	95.0
Maximum limits of impurities:	
Insoluble matter	0.005
Chloride (Cl)	0.010
Arsenic	0.0001
Heavy metals (as Pb)	0.0010
Iron (Fe)	0.002

5.58.3 Use data. Sodium bisulfite, analyzed reagent is intended for military use as a general laboratory reagent.

5.58.4 Packaging data and labeling. Sodium bisulfite, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.58.5 Storage data. Sodium bisulfite, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.59 Name. SODIUM BROMATE, ANALYZED REAGENT $NaBrO_3$ FW 150.91
(HAZARDOUS)

5.59.1 Specifications. MIL-S-11173, Sodium Bromate, Reagent

5.59.2 Technical description. Sodium bromate is in the form of white, odorless crystals or crystalline powder. It is soluble in water and insoluble in alcohol. It has a specific gravity of 3.339 at 17.5°C and a melting point of 381°C. Sodium bromate, analyzed reagent shall conform to the requirements as shown in Table L.

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Table L. - Chemical requirements for sodium bromate, analyzed reagent

Property	Requirement
Assay, as $NaBrO_3$ (min)	99.7
Maximum limits of impurities:	
Insolubles	0.010
Free acid (as $HBrO_3$)	0.01
Free alkali	No reaction
Bromide (Br)	0.05
Sulfate (SO_4)	0.015
Heavy metals (as Pb)	0.0005
Iron (Fe)	0.002

5.59.3 Use data. Sodium bromate, analyzed reagent is intended for military use as a general laboratory reagent.

5.59.4 Packaging data and labeling. Sodium bromate, analyzed reagent is packaged for military use in 1/4 lb and 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

SODIUM BROMATE

CAUTION! STRONG OXIDANT
HARMFUL IF SWALLOWED

Store separately from and avoid contact with combustible materials. Wash thoroughly before eating or smoking.

5.59.5 Storage data. Sodium bromate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.60 Name. SODIUM BROMIDE, ANALYZED REAGENT NaBr FW 102.91

5.60.1 Specifications. MIL-S-14063, Sodium Bromide, Analyzed Reagent

5.60.2 Technical description. Sodium bromide is in the form of a white crystalline powder or granules with a saline, somewhat bitter taste. It is soluble in water and moderately soluble in alcohol. It has a specific gravity of 3.208, a melting point of 757.7°C, and a boiling point of 1390°C. Sodium bromide, analyzed reagent shall conform to the requirements as shown in Table LI.

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Table LI. - Chemical requirements for sodium bromide, analyzed reagent

Property	Requirement
Assay, as NaBr (min)	99.0
Maximum limits of impurities:	
Alkalinity (as Na_2CO_3)	0.12
Chloride (Cl)	0.60
Bromate (BrO_3)	0.002
Sulfate (SO_4)	0.010
Barium (Ba)	0.002
Heavy metals (as Pb)	0.0005

5.60.3 Use data. Sodium bromide, analyzed reagent is intended for military use as a general laboratory reagent.

5.60.4 Packaging data and labeling. Sodium bromide, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.60.5 Storage data. Sodium bromide, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.61 Name. SODIUM CHLORATE, ANALYZED REAGENT (HAZARDOUS) $NaClO_3$ FW 106.45

5.61.1 Specifications. MIL-S-51309, Sodium Chlorate, Analyzed Reagent

5.61.2 Technical description. Sodium chlorate is in the form of colorless, odorless crystals. It is soluble in water and alcohol. It has a specific gravity of 2.490 at 15°C and a melting point of 248°C. Sodium chlorate, analyzed reagent shall conform to the requirements as shown in Table LII.

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Table LII. - Chemical requirements for sodium chlorate, analyzed reagent

Property	Requirement
Assay, as $NaClO_3$ (min)	99.0
Maximum limits of impurities:	
Insoluble	0.010
Bromate (BrO_3)	0.070
Chloride (Cl)	0.005
Nitrogen compounds (as N)	0.001
Sulfate (SO_4)	0.003
Heavy metals (as Pb)	0.001
Iron (Fe)	0.0005
Calcium, magnesium, and ammonium hydroxide ppt.	0.010

5.61.3 Use data. Sodium chlorate, analyzed reagent is intended for military use as a general laboratory reagent.

5.61.4 Packaging data and labeling. Sodium chlorate, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

SODIUM CHLORATE

WARNING! STRONG OXIDANT
HARMFUL IF SWALLOWED
MAY CAUSE IRRITATION OF SKIN AND EYES

Clothing contaminated with solid or solution is DANGEROUSLY FLAMMABLE.
Wash thoroughly after handling.
Store separately from and avoid contact with combustible materials.

5.61.5 Storage data. Sodium chlorate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.62 Name. SODIUM DICHROMATE, DIHYDRATE, ANALYZED REAGENT
Sodium Bichromate $Na_2Cr_2O_7 \cdot 2H_2O$ FW 298.03
(HAZARDOUS)

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5.62.1 Specifications. None.

5.62.2 Technical description. Sodium dichromate, dihydrate is in the form of red or red-orange, deliquescent crystals. It is very soluble in water and insoluble in alcohol. It has a specific gravity of 2.52 at 130°C, a melting point of 357°C, and decomposes at 400°C. It loses its water of hydration on prolonged heating at 105°C.

Table LIII. - Typical properties of sodium dichromate, dihydrate, analyzed reagent

Assay, as $Na_2Cr_7.2H_2O$ (min)	99.0
Maximum limits of impurites:	
Chloride (Cl)	0.005
Sulfate (SO_4)	0.010
Aluminum (Al)	0.002
Calcium (Ca)	0.002

5.62.3 Use data. Sodium dichromate, dihydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.62.4 Packaging data and labeling. Sodium dichromate, dihydrate, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, individual containers must bear the following precautionary label:

SODIUM DICHROMATE

CAUTION! HARMFUL IS SWALLOWED

Avoid contact with skin and eyes.

5.62.5 Storage data. Sodium dichromate, dihydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.63 Name. SODIUM HYDROSULFITE, ANHYDROUS, ANALYZED REAGENT $Na_2S_2O_4$
Sodium Hyposulfite FW 174.11
Sodium Dithionite
(HAZARDOUS)

5.63.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.63.2 Technical description. Sodium hydrosulfite, anhydrous is in the form of a white or grayish crystalline powder. It is soluble in water, and slightly soluble in alcohol. It gradually oxidizes in air, more readily when in solution, to bisulfite, acquiring an acid reaction.

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It is affected by light. Sodium hydrosulfite, anhydrous, analyzed reagent shall conform to the requirements as shown in Table LIV.

Table LIV. - Chemical requirements for sodium hydrosulfite, anhydrous, analyzed reagent

Property	Requirement
Assay, as $Na_2S_2O_4$ (min)	88.0
Maximum limits of impurities:	
Sulfide	To pass test
Heavy metals	To pass test
Suitability for riboflavin assay	To pass test

5.63.3 Use data. Sodium hydrosulfite, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent.

5.63.4 Packaging data and labeling. Sodium hydrosulfite, anhydrous, analyzed reagent is packaged for military use in 1/4 lb unit quantity nonactinic bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT yellow label for flammable solids. In addition, each individual container must bear the following precautionary label:

SODIUM HYDROSULFITE

CAUTION! MAY IGNITE IF ALLOWED TO BECOME DAMP

Keep container tightly closed.
Use only dry, clean utensils in handling.
Store in a cool, dry place.

5.63.5 Storage data. Sodium hydrosulfite, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be protected from light. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.64 Name. SODIUM IODIDE, ANHYDROUS, ANALYZED REAGENT NaI FW 149.89

5.64.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.64.2 Technical description. Sodium iodide, anhydrous is in the form of colorless, odorless crystals, or white, crystalline powder. In moist air it cakes and then deliquesces, and frequently undergoes decomposition, developing a brown tint. It is soluble in water, alcohol, and glycerine.

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It has a specific gravity of 3.665, a melting point of 653°C, and a boiling point of 1304°C. Sodium iodide, anhydrous, analyzed reagent shall contain not less than 99 percent NaI, calculated on the anhydrous basic. It shall also conform to the requirements contained in the "Reagents" portion of the nonmonographed section of the Pharmacopeia of the United States.

5.64.3 Use data. Sodium iodide, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent.

5.64.4 Packaging data and labeling. Sodium iodide, anhydrous, analyzed reagent is packaged for military use in 1/4 lb unit quantity, nonactinic bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.64.5 Storage data. Sodium iodide, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be protected from light. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.65 Name. SODIUM METABISULFITE, ANALYZED REAGENT $Na_2S_2O_5$ FW 190.11

5.65.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.65.2 Technical description. Sodium metabisulfite is in the form of colorless, prismatic crystals or white powder with an odor of sulfur dioxide. It gradually takes on a yellow color upon standing. It is soluble in water and slightly soluble in alcohol. Sodium metabisulfite, analyzed reagent shall conform to the requirements as shown in Table LV.

Table LV. - Chemical requirements for sodium metabisulfite, analyzed reagent

Property	Requirement
Assay, as $Na_2S_2O_5$ (min)	97.00
Maximum limits of impurities:	
Insoluble matter	0.005
Arsenic (As)	0.0001
Iron (Fe)	0.002
Chloride (Cl)	0.05
Heavy metals (as Pb)	0.001

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5.65.3 Use data. Sodium metabisulfite, analyzed reagent is intended for military use as a general laboratory reagent. It is also used for tissue staining.

5.65.4 Packaging data and labeling. Sodium metabisulfite, analyzed reagent is packaged for military use in 25 gm and 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping containers for this chemical.

5.65.5 Storage data. Sodium metabisulfite, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.66 Name. SODIUM METASILICATE, NONAHYDRATE, ANALYZED REAGENT
$NaSiO_3 \cdot 9H_2O$ FW 284.20

5.66.1 Specifications. None.

5.66.2 Technical description. Sodium metasilicate, nonahydrate, is in the form of dustless, white, crystalline granules. It is very soluble in water. It has a melting point of 47°C and loses six of its molecules of water of hydration at 100°C.

Table LVI. - Typical properties of sodium metasilicate, nonahydrate, anlayzed reagent

Maximum limits of impurities:	
Chloride (Cl)	0.010
Heavy metals (as Pb)	0.001
Iron (Fe)	0.005
Sulfate (SO_4)	0.010

5.66.3 Use data. Sodium metasilicate, nonahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.66.4 Packaging data and labeling. Sodium metasilicate, nonahydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.66.5 Storage data. Sodium metasilicate, nonahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

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5.67 Name. SODIUM MOLYBDATE, DIHYDRATE, ANALYZED REAGENT
$Na_2MoO_4 \cdot 2H_2O$ FW 241.97

5.67.1 Specifications. Federal Specification O-C-265, Chemicals, Analytical; General Specification For.

5.67.2 Technical description. Sodium molybdate, dihydrate is in the form of a white, odorless, crystalline powder. It is soluble in water. It has a specific gravity of 3.28 at 18°C, and a melting point of 687°C. Sodium molybdate, dihydrate, analyzed reagent shall conform to the requirements as shown in Table LVII.

Table LVII. - Chemical requirements for sodium molybdate, dihydrate, analyzed reagent

Property	Requirement
Assay, as MoO_3 (min)	57.0
Maximum limits of impurities:	
Insoluble	0.010
Ammonium (NH_4)	0.01
Chloride (Cl)	0.005
Heavy metals (as Pb)	0.003
Nitrate (NO_3)	0.003
Phosphate (PO_4)	0.001
Sulfate (SO_4)	0.02

5.67.3 Use data. Sodium molybdate, dihydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.67.4 Packaging data and labeling. Sodium molybdate, dihydrate, analyzed reagent is packaged for military use in 1/4 lb (113.4 gm) unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.67.5 Storage data. Sodium molybdate, dihydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.68 Name. SODIUM PERBORATE, TETRAHYDRATE, ANALYZED REAGENT
$NaBO_3 \cdot 4H_2O$ FW 153.88

5.68.1 Specifications. MIL-S-14022, Sodium Perborate, Tetrahydrate.

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5.68.2 Technical description. Sodium perborate, tetrahydrate is in the form of a white, crystalline powder. It is stable in cool, dry air, but decomposes with evolution of oxygen in warm or moist air. It is moderately soluble in water (with decomposition) and glycerol. It has a melting point of 63°C. Sodium perborate, tetrahydrate, analyzed reagent shall conform to the requirements as shown in Table LVIII.

Table LVIII. - Chemical requirements for sodium perborate, tetrahydrate, analyzed reagent

Property	Requirement
Available oxygen, min	9.5
Maximum limit of impurities:	
Chloride (Cl)	0.003
Phosphate (PO_4)	0.003
Sulfate (SO_4)	0.005
Heavy metals (as Pb)	0.002
Iron (Fe)	0.001

5.68.3 Use data. Sodium perborate, tetrahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.68.4 Packaging data and labeling. Sodium perborate, tetrahydrate, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.68.5 Storage data. Sodium perborate, tetrahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.69 Name. SODIUM PERCHLORATE, ANHYDROUS, ANALYZED REAGENT (HAZARDOUS) $NaClO_4$ FW 122.44

5.69.1 Specifications. None.

5.69.2 Technical description. Sodium perchlorate is in the form of white or colorless crystals. It is soluble in water and alcohol. It is explosive in contact with concentrated sulfuric acid. It has a specific gravity of 2.02, and a melting point of 482°C. Sodium perchlorate, anhydrous, analyzed reagent shall conform to the requirements of Edgewood Arsenal Purchase Description 4-195 as shown in Table LIX.

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Table LIX. - Chemical requirements for sodium perchlorate anhydrous, analyzed reagent

Property	Requirement
Maximum limits of impurities:	
Chloride (Cl)	0.005
Heavy metals (as Pb)	0.001
Iron (Fe)	0.0007

5.69.3 Use data. Sodium perchlorate, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent.

5.69.4 Packaging data and labeling. Sodium perchlorate, anhydrous, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

SODIUM PERCHLORATE

CAUTION! STRONG OXIDANT
HARMFUL IF SWALLOWED
MAY CAUSE SKIN IRRITATION

Wash thoroughly after handling.
Keep away from heat, sparks, and open flame.
Store separately from and avoid contact with combustible materials.

5.69.5 Storage data. Sodium perchlorate, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.70 Name. SODIUM SELENATE, DECAHYDRATE, ANALYZED REAGENT (HAZARDOUS) $Na_2SeO_4 \cdot 10H_2O$ FW 369.09

5.70.1 Specifications. None.

5.70.2 Technical description. Sodium selenate, decahydrate is in the form of white or colorless crystals. It is soluble in water. It has a specific gravity of 1.58. Sodium selenate, decahydrate, analyzed reagent shall conform to the requirements of Edgewood Arsenal Purchase Description 4-182 as shown in Table LX.

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Table LX. - Chemical requirements for sodium selenate, decahydrate, analyzed reagent

Property	Requirement
Assay, as $Na_2SeO_4 \cdot 10H_2O$ (min)	98.0
Maximum limits of impurities:	
Solubility	To pass test
Carbonate (CO_3)	0.30
Chloride (Cl)	0.02
Nitrate (NO_3)	0.02
Sulfate (SO_4)	0.05
Selenite	0.10

5.70.3 Use data. Sodium selecate, decahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.70.4 Packaging data and labeling. Sodium selenate, decahydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.364 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT poison label for Class B poison. In addition, each individual container must bear the following precautionary label:

SODIUM SELENATE

DANGER! MAY BE FATAL IF SWALLOWED
HEATING PRODUCES TOXIC FUMES

Wash thoroughly after handling.

POISON
CALL A PHYSICIAN

5.70.5 Storage data. Sodium selenate, decahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.71 Name. STANNIC CHLORIDE, ANHYDROUS, ANALYZED REAGENT $SnCl_4$
Tin Chloride FW 260.53
(HAZARDOUS)

5.71.1 Specifications. MIL-S-51294, Stannic Chloride, Anhydrous, Analyzed Reagent

5.71.2 Technical description. Stannic chloride is a colorless, fuming,

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caustic liquid. It is soluble in cold water, alcohol, and carbon disulfide, and decomposes by hot water. It has a specific gravity of 2.226 at 20°C, a melting point of -30.2°C, and a boiling point of 114.1°C. Stannic chloride, anhydrous, analyzed reagent shall conform to the requirements shown in Table LXI.

Table LXI. - Chemical requirements for stannic chloride, anhydrous, analyzed reagent

Property	Requirement
Assay, as $SnCl_4$ (min)	99.0
Maximum limits of impurities:	
Solubility	To pass test
Free Chlorine (Cl)	To pass test
Sulfate	0.001
Substances not ppt by hydrogen sulfide (as sulfates)	0.05
Iron (Fe)	0.001
Arsenic (As)	0.005

5.71.3 Use data. Stannic chloride, anhydrous, analyzed reagent is intended for military use as a general laboratory reagent.

5.71.4 Packaging data and labeling. Stannic chloride, anhydrous, analyzed is packaged for military use in 1/4 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.244 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT white label for corrosive liquids. In addition, each individual container must bear the following precautionary label:

STANNIC CHLORIDE

DANGER! REACTS WITH MOISTURE TO PRODUCE HYDROCHLORIC ACID
VAPOR MAY BE FATAL IS INHALED
CAUSES SEVERE BURNS
MAY BE FATAL IF SWALLOWED

Keep container sealed with plastic tape.
Use with adequate ventilation.
Do not get in eyes, on skin, or on clothing.
In case of contact, immediately remove all contaminated clothing and flush skin or eyes with plenty of water for at least 15 minutes; for eyes get medical attention.

POISON
CALL A PHYSICIAN

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5.71.5 Storage data. Stannic chloride, anhydrous, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be checked periodically for leakage and deterioration of closures. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.72 Name. STANNIC OXIDE, ANALYZED REAGENT SnO_2 FW 150.70
Tin Oxide

5.72.1 Specifications. MIL-S-51270, Stannic Oxide, Analyzed Reagent

5.71.2 Technical description. Stannic oxide is in the form of a white powder. It is insoluble in water. It has a specific gravity of 6.6 - 6.9 and a melting point of 1127°C. It sublimes at 1800 - 1900°C. Stannic oxide, analyzed reagent shall conform to the requirements of Table LXII.

Table LXII. - Chemical requirements for stannic oxide, analyzed reagent

Property	Requirement
Assay, as SnO_2 (min)	99.0
Maximum limits of impurities:	
Water-soluble salts	0.50
Free Alkali (as NaOH)	0.20
Chloride (Cl)	0.005
Sulfate (SO_4)	0.030

5.72.3 Use data. Stannic oxide, analyzed reagent is intended for military use as a general laboratory reagent.

5.72.4 Packaging data and labeling. Stannic oxide, analyzed reagent is packaged for miliary use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.72.5 Storage data. Stannic oxide, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.73 Name. STRONTIUM CHLORIDE, HEXAHYDRATE, ANALYZED REAGENT
$SrCl_2.6H_2O$ FW 266.64

5.73.1 Specifications. MIL-S-51295, Strontium Chloride, Hexahydrate, Analyzed Reagent.

5.73.2 Technical description. Strontium chloride, hexahydrate is in the

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form of white, odorless, crystalline needles. It is soluble in water and alcohol. It has a specific gravity of 1.964 and loses its water of hydration at 100°C. Strontium chloride, hexahydrate, analyzed reagent shall conform to the requirements shown in Table LXIII.

Table LXIII. - Chemical requirements for strontium chloride, hexahydrate, analyzed reagent

Property	Requirement
Assay, as $SrCl_2.6H_2O$	99.0
Maximum limits of impurities:	
Insoluble matter	0.005
Sulfate (SO_4)	0.010
Alkali and magnesium salts	0.30
Barium (Ba)	0.002
Calcium (Ca)	0.60
Heavy metals (as Pb)	0.0005
Iron (Fe)	0.0005

5.73.3 Use data. Strontium chloride, hexahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.73.4 Packaging data and labeling. Strontium chloride, hexahydrate, analyzed reagent is packaged for military use in 1/4 and 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.73.5 Strontium chloride, hexahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.74 Name. STRONTIUM SULFIDE, REAGENT SrS FW 119.68

5.74.1 Specifications. None.

5.74.2 Technical description. Strontium sulfide is in the form of a gray powder. In the presence of moist air it has an odor of hydrogen sulfide. It is slightly soluble in water. It has a specific gravity of 3.7, and a melting point above 2000°C.

5.74.3 Use data. Strontium sulfide is intended for military use as a general laboratory reagent.

5.74.4 Packaging data and labeling. Strontium sulfide, reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

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5.74.5 Storage data. Strontium sulfide, reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.75 Name. THIONYL CHLORIDE, REAGENT $SOCl_2$ FW 118.98
Sulfurous Oxychloride
(HAZARDOUS)

5.75.1 Specifications. Federal Specifications O-T-370, Thionyl Chloride, Reagent.

5.75.2 Technical description. Thionyl chloride is a clear, pale yellow to red liquid with a sharp odor. It has a specific gravity of 1.638, a melting point of -105°C, a boiling point of 79°C, and decomposes at 140°C. It decomposes (fumes) in water. Thionyl chloride, reagent shall be no less than 94.0 percent pure, based on total sulfur content corrected for sulfur chloride and sulfuryl chloride or by difference, whichever shall be the lower. Thionyl chloride, reagent shall also conform to the requirements as shown in Table LXIV.

Table LXIV. - Chemical requirements for thionyl chloride, reagent

Property	Requirement
Maximum limits of impurities:	
Iron (as $FeCl_2$)	0.10
Sulfur chloride (as S_2Cl_2)	1.0
Sulfuryl chloride	5.0
Sulfur dioxide	2.0

5.75.3 Use data. Thionyl chloride, reagent is intended for military use as a general laboratory reagent.

5.75.4 Packaging data and labeling. Thionyl chloride, reagent is packaged for military use in 100 gm unit quantity bottles. Each shipping container must bear the DoT white label for corrosive liquids. In addition, each individual container must bear the following precautionary label:

THIONYL CHLORIDE

WARNING! CAUSES BURNS
VAPOR IRRITATING

Avoid contact with eyes, skin, or clothing
In case of contact, immediately flush eyes or skin with plenty

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of water for at least 15 minutes; for eyes, get medical attention. Do not allow water to get into container because of violent reaction.

5.75.5 Storage data. Thionyl chloride, reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

5.76 Name. VANADIUM PENTOXIDE, ANALYZED REAGENT (HAZARDOUS) V_2O_5 FW 181.90

5.76.1 Specifications. None.

5.76.2 Technical description. Vanadium pentoxide is in the form of a yellow to red, crystalline powder. It is slightly soluble in water, and soluble in acids and alkalies. It has a specific gravity of 3.357 at 18°C, a melting point of 690°C, and decomposes at 1750°C. Vanadium pentoxide, analyzed reagent shall conform to the requirements as shown in Table LXV.

Table LXV. - Chemical requirements for vanadium pentoxide, analyzed reagent

Property	Requirement
Assay, as V_2O_5 (min)	99.5
Maximum limits of impurities:	
Carbon dioxide (CO_2)	0.3
Chlorine (Cl)	0.2

5.76.3 Use data. Vanadium pentoxide, analyzed reagent is intended for military use as a general laboratory reagent.

5.76.4 Packaging data and labeling. Vanadium pentoxide, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical, however, each individual container must have the following precautionary label:

VANADIUM PENTOXIDE

WARNING! CAUSES IRRITATION OF SKIN, EYES, NOSE AND THROAT

Use with adequate ventilation
Wash thoroughly after handling.

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5.76.5 Storage data. Vanadium pentoxide, reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.77 Name. ZINC CARBONATE, ANALYZED REAGENT $ZnCO_3$ FW 125.38

5.77.1 Specifications. None.

5.77.2 Technical description. Zinc carbonate is in the form of a white, odorless powder. It is insoluble in water, but soluble in dilute acids, ammonium hydroxide, and alkali hydroxide solutions. It has a specific gravity of 4.42 - 4.45 and loses carbon dioxide at 300°C.

Table LXVI. - Typical properties of zinc carbonate, analyzed reagent

Assay, as ZnO (min)	77.0
Maximum limits of impurities:	
Insoluble in sulfuric acid	0.020
Chloride (Cl)	0.002
Nitrate (NO_3)	0.005
Sulfate (SO_4)	0.010
Heavy metals (as Pb)	0.005
Iron (Fe)	0.005
Substances not ppt by ammonium sulfide, (as sulfates)	0.500

5.77.3 Use data. Zinc carbonate, analyzed reagent is intended for military use as a general laboratory reagent.

5.77.4 Packaging data and labeling. Zinc carbonate, analyzed reagent is packaged for military use in 1 lb unit quantity bottles. There are no applicable DoT packaging or shipping regulations for this chemical.

5.77.5 Storage data. Zinc carbonate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. Under these storage conditions, the shelf life is indefinite.

5.78 Name. ZINC NITRATE, HEXAHYDRATE, ANALYZED REAGENT $Zn(NO_3)_2.6H_2O$ (HAZARDOUS) FW 297.49

5.78.1 Specifications. MIL-Z-1143, Zinc Nitrate, Reagent

5.78.2 Technical description. Zinc nitrate is in the form of colorless or white, crystals or fragments. It is soluble in water and alcohol. It has a specific gravity of 2.065 at 13°C, and a melting point of 36.4°C. It loses its water of crystallization between 105 and 131°C. Zinc nitrate, hexahydrate, analyzed reagent shall conform to the requirements as shown in Table LXVII.

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Table LXVII. - Chemical requirements for zinc nitrate, hexahydrate, analyzed reagent

Property	Requirement
Assay, as $Zn(NO_3)_2.6H_2O$ (min)	99.0
Maximum limits of impurities:	
Insolubles	0.005
Free acid (as HNO_3)	0.03
Chloride (Cl)	0.005
Phosphate (PO_4)	0.001
Sulfate (SO_4)	0.010
Alkalies and alkaline earths	0.20
Iron (Fe)	0.001
Lead (Pb)	0.005

5.78.3 Use data. Zinc nitrate, hexahydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.78.4 Packaging data and labeling. Zinc nitrate, hexahydrate, analyzed reagent is packaged for military use in 1/4 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, shipping containers must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

ZINC NITRATE

CAUTION! STRONG OXIDANT
HARMFUL IF SWALLOWED

Keep away from heat, sparks, and open flame.
Store separately from and avoid contact with combustible materials.
Wash thoroughly after handling.

5.78.5 Storage data. Zinc nitrate, hexahydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions, the shelf life is indefinite.

5.79 Name. ZIRCONYL NITRATE, DIHYDRATE, ANALYZED REAGENT $ZrO(NO_3)_2.2H_2O$
(HAZARDOUS) FW 267.27

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5.79.1 Specifications. None.

5.79.2 Technical description. Zirconyl nitrate is in the form of white, very hygroscopic crystals or scales. It is very soluble in water, and soluble in alcohol.

Table LXVIII. - Typical properties of zirconyl nitrate, dihydrate, analyzed reagent

Assay, as ZrO_2 (min)	47.0
Maximum limits of impurities:	
Silica (as SiO_2)	0.20
Titanium oxide (TiO_2)	0.50
Iron oxide (as Fe_2O_3)	0.20

5.79.3 Use data. Zirconyl nitrate, dihydrate, analyzed reagent is intended for military use as a general laboratory reagent.

5.79.4 Packaging data and labeling. Zirconyl nitrate, dihydrate, analyzed reagent is packaged for military use in 1 oz and 1 lb unit quantity bottles. Unless otherwise exempt under the provisions of section 173.153 of Title 49, Code of Federal Regulations, each shipping container must bear the DoT yellow label for oxidizing materials. In addition, each individual container must bear the following precautionary label:

ZIRCONYL NITRATE

CAUTION! STRONG OXIDANT
HARMFUL IF SWALLOWED

Keep away from heat, sparks, and open flame.
Store separately from and avoid contact with combustible materials.
Wash thoroughly after handling.

5.79.5 Storage data. Zirconyl nitrate, dihydrate, analyzed reagent should be stored in a cool, dry place in tightly sealed containers. It should be stored away from sources of heat and combustible materials. Under these storage conditions, the shelf life is approximately 1 year from date of manufacture.

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Assignee activity: Defense General Supply Center

Custodians: Army - MU
Air Force - 68

Preparing Activity: - MU

User activities: Army - ME
Navy - YD, MC

Review activity: Army - MI

Project No. 6810-0335

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INDEX

	Page
Aluminum nitrate, nonahydrate	8
Aluminum oxide, anhydrous	9
Amorphous, definition	5
Analyzed reagent, definition	5
Anhydrous, definition	5
Antimonous chloride	10
Antimony chloride	10
Antimony trichloride	10
Antimony trioxide	11
Arsenic chloride	12
Arsecic trichloride	12
Arsenious chloride	12
Arsenous chloride	12
Assay, definition	5
Barium binoxide	13
Barium dioxide, anhydrous	13
Barium perchlorate, anhydrous	15
Barium peroxide	13
Basic bismuth iodide	17
Bismuth nitrate, pentahydrate	16
Bismuth oxyiodide	17
Bismuth subiodide	17
Bismuth trinitrate	16
Boiling point, definition	5
Cadmium nitrate, tetrahydrate	18
Calcium fluoride	19
Calcium nitrate, tetrahydrate	20
Ceric sulfate, anhydrous	21
Cerium sulfate	21
Chromic chloride, hexahydrate	22
Chromic nitrate, nonahydrate	23
Chromium chloride	22
Chromium nitrate	23
Chromium sesquichloride	22
Copper carbonate, basic	24
Copper chloride	25

Downloaded from http://www.everyspec.com

Page

Copper oxide, red ---------- 27
Cupric carbonate, basic---------- 24
Cupric chloride, dihydrate ---------- 25
Cupric sulfate, anhydrous ---------- 26
Cuprous oxide ---------- 27

Decomposition, definition ---------- 5
Deliquescent, definition ---------- 5

Ferric chloride, anhydrous ---------- 27
Ferric sulfate, hydrated ---------- 28
Ferric trichloride ---------- 27
Formula weight, definition ---------- 5

Hazardous substance, definition ---------- 5
Hygroscopic, definition ---------- 6

Iodic acid, anhydride ---------- 30
Iodine chloride ---------- 29
Iodine monochloride ---------- 29
Iodine pentoxide ---------- 30

Lathanum nitrate ---------- 32
Lead oxide, red ---------- 32
Lithium sulfate, monohydrate ---------- 33

Magnesium carbonate, basic, trihydrate ---------- 34
Magnesium iodide, octahydrate ---------- 35
Magnesium perchlorate, anhydrous ---------- 36
Magnesium sulfate, anhydrous ---------- 37
Manganese binoxide ---------- 38
Manganese chloride ---------- 39
Manganese dioxide ---------- 38
Manganous chloride, tetrahydrate ---------- 39
Melting point, definition ---------- 6
Mercuric cyanide ---------- 40
Mercuric nitrate, monohydrate ---------- 41
Mercurous nitrate, monohydrate ---------- 42
Mercury cyanide ---------- 40
Mercury nitrate ---------- 41

Nickel, chloride, hexahydrate ---------- 43
Nickel nitrate, hexahydrate ---------- 44
Nonactinic, definition ---------- 6

Downloaded from http://www.everyspec.com

Page

Palladium chloride, anhydrous ---------- 46
Palladium sulfate, dihydrate ---------- 46
Phosphorous oxychloride ---------- 47
Phosphorous pentachloride ---------- 48
Phosphorous trichloride ---------- 49
Phosphoryl chloride ---------- 47
Potassium arsenate, monobasic ---------- 50
Potassium bi-iodate ---------- 51
Potassium cyanide ---------- 52
Potassium fluoride, dihydrate ---------- 53
Potassium hydrogen phosphate ---------- 55
Potassium persulfate ---------- 54
Potassium phosphate, dibasic, anhydrous ---------- 55
Potassium pyroantimonate ---------- 56
Potassium tellurite ---------- 57

Reagent grade, definition ---------- 6
Reagent, definition ---------- 6

Silver carbonate ---------- 58
Silver cyanide ---------- 59
Silver iodate ---------- 60
Silver perchlorate, anhydrous ---------- 61
Sodium acid sulfate ---------- 64
Sodium acid sulfite ---------- 65
Sodium arsenate, dibasic, heptahydrate ---------- 61
Sodium arsenite ---------- 63
Sodium bichromate ---------- 68
Sodium bisulfate, monohydrate ---------- 64
Sodium bisulfite ---------- 65
Sodium bromate ---------- 65
Sodium bromide ---------- 66
Sodium chlorate ---------- 67
Sodium dichromate, dihydrate ---------- 68
Sodium dithionite ---------- 69
Sodium hydrosulfite, anhydrous ---------- 69
Sodium hyposulfite ---------- 69
Sodium iodide, anhydrous ---------- 70
Sodium metabisulfite ---------- 71
Sodium metasilicate ---------- 72
Sodium molybdate, dihydrate ---------- 73
Sodium perborate, tetrahydrate ---------- 73
Sodium perchlorate, anhydrous ---------- 74
Sodium selenate, decahydrate ---------- 75
Specific gravity, definition ---------- 6
Stannic chloride, anhydrous ---------- 76

Downloaded from http://www.everyspec.com

Page

Stannic oxide ---------- 78
Strontium chloride, hexahydrate ---------- 78
Strontium sulfide ---------- 79
Sulfurous oxychloride ---------- 80

Thionyl chloride ---------- 80
Tin chloride ---------- 76
Tin oxide ---------- 78

Vanadium pentoxide ---------- 81

Zinc carbonate ---------- 82
Zinc nitrate, hexahydrate ---------- 82
Zirconyl nitrate, dihydrate ---------- 83

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