

Supplementary Material A - Analytical standards

Garnet

Analysis Parameters:

Sp	Elements	Xtal	Position	Bg+	Bg-	Slope	Bias	Gain	Dtime	Blin	Wind	Mode	
Sp3	Fe Ka		LLIF	48091				950	1	1850	461	3	560
Sp3	Mn Ka		LLIF	52190				600	1	1850	461	3	560
Sp1	Si Ka		TAP	27741				750	1	1294	2959	3	560
Sp5	Ti Ka		LPET	31419				600	1	1851	1026	3	560
Sp4	Na Ka		TAP	46349		-800,00		800		1291	2927	3	560
Sp4	Al Ka		TAP	32477				800	1	1291	2927	3	560
Sp3	Ni Ka		LLIF	41177				600	1	1845	453	3	560
Sp1	Mg Ka		TAP	38505		-1100,00		1100		1294	2959	3	560
Sp2	Ca Ka		LPET	38385				700	1	1293	996	3	560
Sp2	Cr Ka		LPET	26643		-600,00		600		1293	996	3	560

Standard Name :

Fe On Almandine**Mn On Rhodonite GEO MKII****Si, Al On Sanidine****Ti On Rutile****Na On Albite****Ni On Ni****Mg, Ca On Diopside****Cr On Chromium oxide**

Standard composition :

Almandine = Fe : 18.09%, Al : 11.67%, Si : 18.32%, O : 42.01%, Mg : 6.45%, Ca : 3%, Mn : 0.46%

Rhodonite GEO MKII = Mn : 32.8499%, Si : 22.1126%, O : 37.7621%, Mg : 1.1216%, Ca : 5.0993%, Fe : 0.7905%

Sanidine = O : 46.28%, Al : 9.93%, Si : 30.23%, K : 10.05%, Fe : 0.14%, Ba : 0.98%, Na : 2.23%

Rutile = Ti : 59.95%, O : 40.05%

Albite = Na : 8.6%, Al : 10.34%, Si : 32.03%, O : 48.76%, K : 0.18%, Ca : 0.09%

Ni = Ni : 99.999%

Diopside = Mg : 11.23%, Ca : 18.39%, Si : 25.88%, O : 44.3%, Al : 0.05%, Ti : 0.05%, Mn : 0.04%, Fe : 0.04%

Chromium oxide = Cr : 68.4195%, O : 31.5805%

Beam Size : 5 µm**Ilmenite**

Analysis Parameters:

Sp	Elements	Xtal	Position	Bg+	Bg-	Slope	Bias	Gain	Dtime	Blin	Wind	Mode	
Sp3	Fe Ka		LLIF	48082,00				950,00	1,05	1850,00	461,00	3,00	560,00
Sp3	Mn Ka		LLIF	52190,00				600,00	1,05	1850,00	461,00	3,00	560,00
Sp1	Si Ka		TAP	27741,00				750,00	1,10	1294,00	2959,00	3,00	560,00
Sp5	Ti Ka		LPET	31419,00				600,00	1,02	1851,00	1026,00	3,00	560,00
Sp4	Al Ka		TAP	32477,00				800,00	1,20	1291,00	2927,00	3,00	560,00
Sp3	Ni Ka		LLIF	41177,00				600,00	1,05	1845,00	453,00	3,00	560,00
Sp1	Mg Ka		TAP	38505,00		-1100,00		1100,00		1294,00	2959,00	3,00	560,00
Sp2	Ca Ka		LPET	38385,00				700,00	1,10	1293,00	996,00	3,00	560,00
Sp2	Cr Ka		LPET	26643,00		-600,00		600,00		1293,00	996,00	3,00	560,00
Sp3	Zn Ka		LLIF	35641,00				600,00	1,05	1850,00	461,00	3,00	560,00
Sp5	V Ka		LPET	28618,00		-1000,00		1000,00		1851,00	1026,00	3,00	560,00

Standard Name :

Fe On Hematite**Mn On Rhodonite GEO MKII****Si, Al On Sanidine****Ti On Rutile****Ni On Ni****Mg, Ca On Diopside****Cr On Chromium oxide****Zn On Willemite****V On V**

Standard composition :

Hematite = Fe : 69.9426%, O : 30.0574%

Rhodonite GEO MKII = Mn : 32.8499%, Si : 22.1126%, O : 37.7621%, Mg : 1.1216%, Ca : 5.0993%, Fe : 0.7905%

Sanidine = O : 46.28%, Al : 9.93%, Si : 30.23%, K : 10.05%, Fe : 0.14%, Ba : 0.98%, Na : 2.23%

Rutile = Ti : 59.95%, O : 40.05%

Ni = Ni : 99.999%

Diopside = Mg : 11.23%, Ca : 18.39%, Si : 25.88%, O : 44.3%, Al : 0.05%, Ti : 0.05%, Mn : 0.04%, Fe : 0.04%

Chromium oxide = Cr : 68.4195%, O : 31.5805%

Willemite = O : 29.4%, Si : 13.13%, Mn : 3.73%, Zn : 53.74%

V = V : 100.%

Beam Size : 5 µm**Tourmaline**

Analysis Parameters:

Sp	Elements	Xtal	Position	Bg+	Bg-	Slope	Bias	Gain	Dtime	Blin	Wind	Mode	
Sp3	Fe Ka		LLIF	48082,00				950,00	1,05	1850,00	461,00	3,00	560,00
Sp3	Mn Ka		LLIF	52190,00				600,00	1,05	1850,00	461,00	3,00	560,00
Sp1	Si Ka		TAP	27741,00				750,00	1,10	1294,00	2959,00	3,00	560,00
Sp5	K Ka		LPET	42765,00				600,00	1,10	1851,00	1026,00	3,00	560,00
Sp5	Ti Ka		LPET	31419,00				600,00	1,02	1851,00	1026,00	3,00	560,00
Sp4	Na Ka		TAP	46349,00		-800,00		800,00		1291,00	2927,00	3,00	560,00
Sp4	Al Ka		TAP	32477,00				800,00	1,20	1291,00	2927,00	3,00	560,00
Sp3	Ni Ka		LLIF	41177,00				600,00	1,05	1845,00	453,00	3,00	560,00
Sp1	Mg Ka		TAP	38505,00		-1100,00		1100,00		1294,00	2959,00	3,00	560,00
Sp2	Ca Ka		LPET	38385,00				700,00	1,10	1293,00	996,00	3,00	560,00
Sp2	Cr Ka		LPET	26643,00		-600,00		600,00		1293,00	996,00	3,00	560,00

Standard Name :

Fe On Hematite**Mn On Rhodonite GEO MKII****Si, K, Al On Sanidine****Ti On Rutile****Na On Albite****Ni On Ni****Mg, Ca On Diopside****Cr On Chromium oxide**

Standard composition :

Hematite = Fe : 69.9426%, O : 30.0574%

Rhodonite GEO MKII = Mn : 32.8499%, Si : 22.1126%, O : 37.7621%, Mg : 1.1216%, Ca : 5.0993%, Fe : 0.7905%

Sanidine = O : 46.28%, Al : 9.93%, Si : 30.23%, K : 10.05%, Fe : 0.14%, Ba : 0.98%, Na : 2.23%

Rutile = Ti : 59.95%, O : 40.05%

Albite = Na : 8.6%, Al : 10.34%, Si : 32.03%, O : 48.76%, K : 0.18%, Ca : 0.09%

Ni = Ni : 99.999%

Diopside = Mg : 11.23%, Ca : 18.39%, Si : 25.88%, O : 44.3%, Al : 0.05%, Ti : 0.05%, Mn : 0.04%, Fe : 0.04%

Chromium oxide = Cr : 68.4195%, O : 31.5805%

Beam Size : 5 µm