

OXIDE	WT %	MOL WT	ATOMS
WO3	0.16	231.80	0.004 W
Ta2O5	59.80	220.90	1.432 Ta
Nb2O5	9.39	132.90	0.374 Nb
TiO2	2.87	79.90	0.190 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.00	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.11	264.00	0.002 Th
UO2	0.00	270.00	0.000 U+4
UO3	6.45	286.00	0.119 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.11	112.90	0.005 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.26	164.10	0.008 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.28	145.70	0.010 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.62	70.94	0.046 Mn+2
FeO	0.53	71.85	0.039 Fe+2
CaO	11.90	56.08	1.123 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.99	223.20	0.023 Pb+2
Na2O	3.00	30.99	0.512 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.74	19.00	0.485 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	98.21		6.550 O
LESS O=F	0.73		
TOTAL	97.48		

A B O (O OH F) . 0.00 H2O
 1.89 2.0 6.00 0.55 0.00 0.48

(O + OH + F) = 1.03 Vacancies: 0.11 A -.03 Y
 Dose (alphas/mg) = 0.265E+18 DPA (displacements/atom) = 32.8

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Fe+2,Pb+2,Sb+3,Ce ,Y ,Th ,K ,Pr
 Mean A valence = 2.00

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.91

OXIDE	WT %	MOL WT	ATOMS
WO3	0.21	231.80	0.005 W
Ta2O5	58.70	220.90	1.368 Ta
Nb2O5	10.90	132.90	0.422 Nb
TiO2	3.18	79.90	0.205 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.00	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.09	264.00	0.002 Th
UO2	0.00	270.00	0.000 U+4
UO3	7.39	286.00	0.133 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.12	112.90	0.005 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.35	164.10	0.011 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.34	145.70	0.012 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	1.25	70.94	0.091 Mn+2
FeO	0.62	71.85	0.044 Fe+2
CaO	10.90	56.08	1.001 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.01	153.30	0.000 Ba
PbO	1.02	223.20	0.024 Pb+2
Na2O	2.40	30.99	0.399 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	0.99	19.00	0.268 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	98.47		6.570 O
LESS O=F	0.42		
TOTAL	98.06		

A B O (O OH F) . 0.00 H2O
 1.72 2.0 6.00 0.57 0.00 0.27

(O + OH + F) = 0.84 Vacancies: 0.28 A 0.16 Y
 Dose (alphas/mg) = 0.302E+18 DPA (displacements/atom) = 38.0

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Fe+2,Pb+2,Sb+3,Ce ,Y ,Th ,Ba ,K
 Mean A valence = 2.10

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.90

OXIDE	WT %	MOL WT	ATOMS
WO3	0.31	231.80	0.007 W
Ta2O5	59.10	220.90	1.386 Ta
Nb2O5	10.20	132.90	0.397 Nb
TiO2	3.23	79.90	0.209 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.02	150.70	0.001 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.06	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	7.26	286.00	0.131 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.08	112.90	0.004 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.23	164.10	0.007 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.38	145.70	0.014 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.70	70.94	0.051 Mn+2
FeO	0.43	71.85	0.031 Fe+2
CaO	11.40	56.08	1.053 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	1.19	223.20	0.028 Pb+2
Na2O	2.76	30.99	0.461 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.35	19.00	0.368 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	98.70		6.541 O
LESS O=F	0.57		
TOTAL	98.13		

A B O (O OH F) . 0.00 H2O
 1.78 2.0 6.00 0.54 0.00 0.37

(O + OH + F) = 0.91 Vacancies: 0.22 A 0.09 Y
 Dose (alphas/mg) = 0.296E+18 DPA (displacements/atom) = 36.9

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Fe+2,Pb+2,Sb+3,Ce ,Y ,Th ,K ,Pr
 Mean A valence = 2.05

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.90

OXIDE	WT %	MOL WT	ATOMS
W03	0.13	231.80	0.003 W
Ta205	60.50	220.90	1.421 Ta
Nb205	10.10	132.90	0.394 Nb
Ti02	2.79	79.90	0.181 Ti
Zr02	0.00	123.20	0.000 Zr
Sn02	0.03	150.70	0.001 Sn
Fe203	0.00	159.70	0.000 Fe+3
Th02	0.15	264.00	0.003 Th
U02	0.00	270.00	0.000 U+4
U03	6.65	286.00	0.121 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.12	112.90	0.006 Y
La203	0.00	162.90	0.000 La
Ce203	0.23	164.10	0.007 Ce
Pr203	0.00	164.90	0.000 Pr
Nd203	0.00	168.20	0.000 Nd
Sm203	0.00	174.40	0.000 Sm
Sb203	0.26	145.70	0.009 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
Mn0	0.56	70.94	0.041 Mn+2
Fe0	0.82	71.85	0.059 Fe+2
Ca0	11.60	56.08	1.073 Ca
Sr0	0.00	103.60	0.000 Sr
Ba0	0.09	153.30	0.003 Ba
Pb0	0.83	223.20	0.019 Pb+2
Na20	3.26	30.99	0.546 Na
K20	0.00	47.10	0.000 K
Cs20	0.00	140.90	0.000 Cs
F	1.63	19.00	0.445 F
H20+	0.00	9.01	0.000 OH
H20-	0.00	18.02	0.000 H2O
TOTAL	99.75		6.557 O
LESS O=F	0.68		
TOTAL	99.07		

A B O (O OH F) . 0.00 H2O
 1.89 2.0 6.00 0.56 0.00 0.45

(O + OH + F) = 1.00 Vacancies: 0.11 A 0.00 Y
 Dose (alphas/mg) = 0.269E+18 DPA (displacements/atom) = 33.3

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Fe+2,Mn+2,Pb+2,Sb+3,Ce ,Y ,Ba ,Th ,K
 Mean A valence = 1.98

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.91

OXIDE	WT %	MOL WT	ATOMS
W03	0.00	231.80	0.000 W
Ta205	69.80	220.90	1.702 Ta
Nb205	6.68	132.90	0.271 Nb
Ti02	0.41	79.90	0.028 Ti
Zr02	0.00	123.20	0.000 Zr
Sn02	0.00	150.70	0.000 Sn
Fe203	0.00	159.70	0.000 Fe+3
Th02	0.05	264.00	0.001 Th
U02	0.00	270.00	0.000 U+4
U03	2.75	286.00	0.052 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.08	112.90	0.004 Y
La203	0.00	162.90	0.000 La
Ce203	0.03	164.10	0.001 Ce
Pr203	0.00	164.90	0.000 Pr
Nd203	0.00	168.20	0.000 Nd
Sm203	0.00	174.40	0.000 Sm
Sb203	0.09	145.70	0.003 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
MnO	0.21	70.94	0.016 Mn+2
FeO	0.27	71.85	0.020 Fe+2
CaO	11.90	56.08	1.143 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.07	223.20	0.002 Pb+2
Na2O	3.00	30.99	0.521 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.04	140.90	0.002 Cs
F	1.95	19.00	0.553 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.33		6.322 O
LESS O=F	0.82		
TOTAL	96.52		

A B O (O OH F) . 0.00 H2O
 1.76 2.0 6.00 0.32 0.00 0.55

(O + OH + F) = 0.87 Vacancies: 0.24 A 0.13 Y
 Dose (alphas/mg) = 0.114E+18 DPA (displacements/atom) = 14.3

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Fe+2,Mn+2,Y ,Sb+3,Pb+2,Th ,Ce ,K ,Sm
 Mean A valence = 1.83

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.99

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OXIDE	WT %	MOL WT	ATOMS
W03	0.00	231.80	0.000 W
Ta205	70.30	220.90	1.668 Ta
Nb205	8.38	132.90	0.331 Nb
Ti02	0.02	79.90	0.001 Ti
Zr02	0.00	123.20	0.000 Zr
Sn02	0.00	150.70	0.000 Sn
Fe203	0.00	159.70	0.000 Fe+3
Th02	0.00	264.00	0.000 Th
U02	0.00	270.00	0.000 U+4
U03	2.17	286.00	0.040 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.07	112.90	0.003 Y
La203	0.00	162.90	0.000 La
Ce203	0.06	164.10	0.002 Ce
Pr203	0.00	164.90	0.000 Pr
Nd203	0.00	168.20	0.000 Nd
Sm203	0.00	174.40	0.000 Sm
Sb203	0.05	145.70	0.002 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
MnO	0.08	70.94	0.006 Mn+2
FeO	0.01	71.85	0.001 Fe+2
CaO	11.20	56.08	1.047 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.06	223.20	0.001 Pb+2
Na2O	4.28	30.99	0.724 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.02	140.90	0.001 Cs
F	2.63	19.00	0.726 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.33		6.184 O
LESS O=F	1.10		
TOTAL	98.23		

A B O (O OH F) . 0.00 H2O
 1.83 2.0 6.00 0.18 0.00 0.73

(O + OH + F) = 0.91 Vacancies: 0.17 A 0.09 Y
 Dose (alphas/mg) = 0.886E+17 DPA (displacements/atom) = 10.8

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Y ,Ce ,Sb+3,Pb+2,Fe+2,K ,Sm ,La
 Mean A valence = 1.69

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 5.00

OXIDE	WT %	MOL WT	ATOMS
WO3	0.10	231.80	0.002 W
Ta2O5	73.20	220.90	1.761 Ta
Nb2O5	5.21	132.90	0.208 Nb
TiO2	0.43	79.90	0.029 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.00	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.00	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	2.32	286.00	0.043 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.06	112.90	0.003 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.07	164.10	0.002 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.09	145.70	0.003 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.21	70.94	0.016 Mn+2
FeO	0.27	71.85	0.020 Fe+2
CaO	11.70	56.08	1.109 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.04	153.30	0.001 Ba
PbO	0.07	223.20	0.002 Pb+2
Na2O	3.41	30.99	0.585 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	2.04	19.00	0.571 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.22		6.283 O
LESS O=F	0.86		
TOTAL	98.36		

A B O (O OH F) , 0.00 H2O
 1.78 2.0 6.00 0.28 0.00 0.57

(O + OH + F) = 0.85 Vacancies: 0.22 A 0.15 Y
 Dose (alphas/mg) = 0.945E+17 DPA (displacements/atom) = 11.9

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Fe+2,Mn+2,Sb+3,Y ,Ce ,Pb+2,Ba ,K ,La
 Mean A valence = 1.77

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.99

OXIDE	WT %	MOL WT	ATOMS
W03	0.10	231.80	0.002 W
Ta205	75.20	220.90	1.833 Ta
Nb205	3.44	132.90	0.139 Nb
Ti02	0.37	79.90	0.025 Ti
Zr02	0.00	123.20	0.000 Zr
Sn02	0.00	150.70	0.000 Sn
Fe203	0.00	159.70	0.000 Fe+3
Th02	0.01	264.00	0.000 Th
U02	0.00	270.00	0.000 U+4
U03	2.27	286.00	0.043 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.03	112.90	0.001 Y
La203	0.00	162.90	0.000 La
Ce203	0.13	164.10	0.004 Ce
Pr203	0.00	164.90	0.000 Pr
Nd203	0.00	168.20	0.000 Nd
Sm203	0.00	174.40	0.000 Sm
Sb203	0.12	145.70	0.004 Sb+3
Bi203	0.03	233.00	0.001 Bi+3
MnO	0.33	70.94	0.025 Mn+2
FeO	0.30	71.85	0.022 Fe+2
CaO	10.90	56.08	1.047 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.02	153.30	0.001 Ba
PbO	0.06	223.20	0.001 Pb+2
Na2O	3.53	30.99	0.613 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.01	140.90	0.000 Cs
F	2.32	19.00	0.658 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.17		6.208 O
LESS O=F	0.97		
TOTAL	98.19		

A B O (O OH F) . 0.00 H2O
 1.76 2.0 6.00 0.21 0.00 0.66

(O + OH + F) = 0.87 Vacancies: 0.24 A 0.13 Y
 Dose (alphas/mg) = 0.925E+17 DPA (displacements/atom) = 11.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Fe+2,Sb+3,Ce ,Pb+2,Y ,Ba ,Bi+3,Th
 Mean A valence = 1.76

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.99

OXIDE	WT %	MOL WT	ATOMS
WO3	0.05	231.80	0.001 W
Ta2O5	68.70	220.90	1.681 Ta
Nb2O5	7.52	132.90	0.306 Nb
TiO2	0.17	79.90	0.012 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.00	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.00	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	2.39	286.00	0.045 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.06	112.90	0.003 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.07	164.10	0.002 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.09	145.70	0.003 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.43	70.94	0.033 Mn+2
FeO	0.48	71.85	0.036 Fe+2
CaO	11.70	56.08	1.128 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.21	223.20	0.005 Pb+2
Na2O	3.01	30.99	0.525 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.01	140.90	0.000 Cs
F	2.03	19.00	0.578 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.92		6.319 O
LESS O=F	0.85		
TOTAL	96.07		

A B O (O OH F) . 0.00 H2O
 1.78 2.0 6.00 0.32 0.00 0.58

(O + OH + F) = 0.90 Vacancies: 0.22 A 0.10 Y
 Dose (alphas/mg) = 0.998E+17 DPA (displacements/atom) = 12.5

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Fe+2,Mn+2,Pb+2,Sb+3,Y ,Ce ,K ,Sm ,Nd
 Mean A valence = 1.81

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.99

OXIDE	WT %	MOL WT	ATOMS
WO3	0.22	231.80	0.005 W
Ta2O5	61.80	220.90	1.473 Ta
Nb2O5	10.10	132.90	0.400 Nb
TiO2	1.85	79.90	0.122 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.00	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.00	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	5.14	286.00	0.095 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.00	112.90	0.000 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.00	164.10	0.000 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.32	145.70	0.012 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.10	70.94	0.007 Mn+2
FeO	0.07	71.85	0.005 Fe+2
CaO	11.40	56.08	1.070 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.75	223.20	0.018 Pb+2
Na2O	3.49	30.99	0.593 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.72	19.00	0.477 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.96		6.401 O
LESS O=F	0.72		
TOTAL	96.24		

A B O (O OH F) . 0.00 H2O
 1.80 2.0 6.00 0.40 0.00 0.48

(O + OH + F) = 0.88 Vacancies: 0.20 A 0.12 Y
 Dose (alphas/mg) = 0.214E+18 DPA (displacements/atom) = 26.3

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Pb+2,Sb+3,Mn+2,Fe+2,K ,Pr ,Nd ,Sm ,Y
 Mean A valence = 1.89

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.94

OXIDE	WT %	MOL WT	ATOMS
W03	0.37	231.80	0.008 W
Ta205	63.60	220.90	1.496 Ta
Nb205	9.67	132.90	0.378 Nb
Ti02	1.81	79.90	0.118 Ti
Zr02	0.00	123.20	0.000 Zr
Sn02	0.00	150.70	0.000 Sn
Fe203	0.00	159.70	0.000 Fe+3
Th02	0.00	264.00	0.000 Th
U02	0.00	270.00	0.000 U+4
U03	4.78	286.00	0.087 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.00	112.90	0.000 Y
La203	0.00	162.90	0.000 La
Ce203	0.00	164.10	0.000 Ce
Pr203	0.00	164.90	0.000 Pr
Nd203	0.00	168.20	0.000 Nd
Sm203	0.00	174.40	0.000 Sm
Sb203	0.38	145.70	0.014 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
Mn0	0.69	70.94	0.051 Mn+2
Fe0	0.46	71.85	0.033 Fe+2
Ca0	11.20	56.08	1.038 Ca
Sr0	0.00	103.60	0.000 Sr
Ba0	0.00	153.30	0.000 Ba
Pb0	0.45	223.20	0.010 Pb+2
Na20	4.00	30.99	0.671 Na
K20	0.00	47.10	0.000 K
Cs20	0.00	140.90	0.000 Cs
F	2.08	19.00	0.569 F
H20+	0.00	9.01	0.000 OH
H20-	0.00	18.02	0.000 H2O
TOTAL	99.49		6.409 O
LESS O=F	0.87		
TOTAL	98.61		

A B O (O OH F) . 0.00 H2O
 1.90 2.0 6.00 0.41 0.00 0.57

(O + OH + F) = 0.98 Vacancies: 0.10 A 0.02 Y
 Dose (alphas/mg) = 0.194E+18 DPA (displacements/atom) = 23.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Fe+2,Sb+3,Pb+2,K ,Pr ,Nd ,Sm ,La
 Mean A valence = 1.84

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.95

OXIDE	WT %	MOL WT	ATOMS
W03	0.14	231.80	0.003 W
Ta205	64.00	220.90	1.526 Ta
Nb205	7.62	132.90	0.302 Nb
Ti02	2.56	79.90	0.169 Ti
Zr02	0.00	123.20	0.000 Zr
Sn02	0.00	150.70	0.000 Sn
Fe203	0.00	159.70	0.000 Fe+3
Th02	0.00	264.00	0.000 Th
U02	0.00	270.00	0.000 U+4
U03	5.73	286.00	0.106 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.00	112.90	0.000 Y
La203	0.00	162.90	0.000 La
Ce203	0.00	164.10	0.000 Ce
Pr203	0.00	164.90	0.000 Pr
Nd203	0.00	168.20	0.000 Nd
Sm203	0.00	174.40	0.000 Sm
Sb203	0.43	145.70	0.016 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
MnO	0.42	70.94	0.031 Mn+2
FeO	0.34	71.85	0.025 Fe+2
CaO	11.40	56.08	1.071 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.85	223.20	0.020 Pb+2
Na2O	3.95	30.99	0.671 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.69	19.00	0.469 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.13		6.505 O
LESS O=F	0.71		
TOTAL	98.42		

A B O (O OH F) . 0.00 H2O
 1.94 2.0 6.00 0.51 0.00 0.47

(O + OH + F) = 0.97 Vacancies: 0.06 A 0.03 Y
 Dose (alphas/mg) = 0.233E+18 DPA (displacements/atom) = 28.9

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Fe+2,Pb+2,Sb+3,K ,Pr ,Nd ,Sm ,Ce
 Mean A valence = 1.88

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.92

OXIDE	WT %	MOL WT	ATOMS
WO3	0.32	231.80	0.007 W
Ta2O5	64.50	220.90	1.513 Ta
Nb2O5	8.79	132.90	0.343 Nb
TiO2	2.11	79.90	0.137 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.00	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.00	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	4.52	286.00	0.082 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.00	112.90	0.000 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.00	164.10	0.000 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.43	145.70	0.015 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.43	70.94	0.031 Mn+2
FeO	0.19	71.85	0.014 Fe+2
CaO	11.70	56.08	1.081 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.78	223.20	0.018 Pb+2
Na2O	4.04	30.99	0.676 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	2.17	19.00	0.592 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.98		6.390 O
LESS O=F	0.91		
TOTAL	99.07		

A B O (O OH F) . 0.00 H2O
 1.92 2.0 6.00 0.39 0.00 0.59

(O + OH + F) = 0.98 Vacancies: 0.08 A 0.02 Y
 Dose (alphas/mg) = 0.183E+18 DPA (displacements/atom) = 22.3

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2 ,Pb+2 ,Sb+3 ,Fe+2 ,K ,Pr ,Nd ,Sm ,La
 Mean A valence = 1.83

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.94

OXIDE	WT %	MOL WT	ATOMS
WO3	0.21	231.80	0.005 W
Ta2O5	63.00	220.90	1.514 Ta
Nb2O5	9.10	132.90	0.364 Nb
TiO2	1.77	79.90	0.118 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.00	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.00	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	4.64	286.00	0.086 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.00	112.90	0.000 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.00	164.10	0.000 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.32	145.70	0.012 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.55	70.94	0.041 Mn+2
FeO	0.26	71.85	0.019 Fe+2
CaO	12.50	56.08	1.183 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.53	223.20	0.013 Pb+2
Na2O	2.95	30.99	0.505 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.81	19.00	0.506 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.64		6.476 O
LESS O=F	0.76		
TOTAL	96.88		

A B O (O OH F) . 0.00 H2O
 1.86 2.0 6.00 0.48 0.00 0.51

(O + OH + F) = 0.98 Vacancies: 0.14 A 0.02 Y
 Dose (alphas/mg) = 0.192E+18 DPA (displacements/atom) = 23.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Fe+2,Pb+2,Sb+3,K ,Pr ,Nd ,Sm ,Ce
 Mean A valence = 1.92

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.94

OXIDE	WT %	MOL WT	ATOMS
WO3	0.37	231.80	0.008 W
Ta2O5	59.90	220.90	1.405 Ta
Nb2O5	10.40	132.90	0.406 Nb
TiO2	2.79	79.90	0.181 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.00	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.00	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	6.28	286.00	0.114 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.00	112.90	0.000 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.00	164.10	0.000 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.38	145.70	0.014 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.51	70.94	0.037 Mn+2
FeO	0.61	71.85	0.044 Fe+2
CaO	11.00	56.08	1.016 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.87	223.20	0.020 Pb+2
Na2O	2.73	30.99	0.457 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.48	19.00	0.404 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.32		6.420 O
LESS O=F	0.62		
TOTAL	96.70		

A B O (O OH F) . 0.00 H2O
 1.70 2.0 6.00 0.42 0.00 0.40

(O + OH + F) = 0.82 Vacancies: 0.30 A 0.18 Y
 Dose (alphas/mg) = 0.260E+18 DPA (displacements/atom) = 32.1

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Fe+2,Mn+2,Pb+2,Sb+3,K ,Pr ,Nd ,Sm ,Ce
 Mean A valence = 2.01

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.91

OXIDE	WT %	MOL WT	ATOMS
W03	0.28	231.80	0.006 W
Ta205	62.40	220.90	1.491 Ta
Nb205	8.74	132.90	0.347 Nb
Ti02	2.35	79.90	0.155 Ti
Zr02	0.00	123.20	0.000 Zr
Sn02	0.00	150.70	0.000 Sn
Fe203	0.00	159.70	0.000 Fe+3
Th02	0.00	264.00	0.000 Th
U02	0.00	270.00	0.000 U+4
U03	5.61	286.00	0.104 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.00	112.90	0.000 Y
La203	0.00	162.90	0.000 La
Ce203	0.00	164.10	0.000 Ce
Pr203	0.00	164.90	0.000 Pr
Nd203	0.00	168.20	0.000 Nd
Sm203	0.00	174.40	0.000 Sm
Sb203	0.30	145.70	0.011 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
MnO	0.45	70.94	0.033 Mn+2
FeO	0.27	71.85	0.020 Fe+2
CaO	12.20	56.08	1.148 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.92	223.20	0.022 Pb+2
Na2O	2.76	30.99	0.470 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.62	19.00	0.450 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.90		6.486 O
LESS O=F	0.68		
TOTAL	97.22		

A B O (O OH F) . 0.00 H2O
 1.81 2.0 6.00 0.49 0.00 0.45

(O + OH + F) = 0.94 Vacancies: 0.19 A 0.06 Y
 Dose (alphas/mg) = 0.231E+18 DPA (displacements/atom) = 28.8

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2 ,Pb+2 ,Fe+2 ,Sb+3 ,K ,Pr ,Nd ,Sm ,Ce
 Mean A valence = 1.98

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.93

OXIDE	WT %	MOL WT	ATOMS
WO3	0.25	231.80	0.006 W
Ta2O5	66.60	220.90	1.579 Ta
Nb2O5	6.35	132.90	0.250 Nb
TiO2	2.52	79.90	0.165 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.00	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.00	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	4.49	286.00	0.082 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.00	112.90	0.000 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.00	164.10	0.000 Ce
Pr2O3	0.00	164.90	0.000 Pr
Nd2O3	0.00	168.20	0.000 Nd
Sm2O3	0.00	174.40	0.000 Sm
Sb2O3	0.37	145.70	0.013 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.78	70.94	0.058 Mn+2
FeO	1.34	71.85	0.098 Fe+2
CaO	11.50	56.08	1.074 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.55	223.20	0.013 Pb+2
Na2O	3.36	30.99	0.568 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.47	19.00	0.405 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.58		6.510 O
LESS O=F	0.62		
TOTAL	98.96		

A B O (O OH F) . 0.00 H2O
 1.91 2.0 6.00 0.51 0.00 0.41

(O + OH + F) = 0.92 Vacancies: 0.09 A 0.08 Y
 Dose (alphas/mg) = 0.182E+18 DPA (displacements/atom) = 22.8

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,Fe+2,U+6 ,Mn+2,Sb+3,Pb+2,K ,Pr ,Nd ,Sm ,La
 Mean A valence = 1.88

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.92