

OXIDE	WT %	MOL WT	ATOMS
WO3	0.10	231.80	0.002 W
Ta2O5	66.20	220.90	1.554 Ta
Nb2O5	10.50	132.90	0.410 Nb
TiO2	0.53	79.90	0.034 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	0.02	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	2.98	286.00	0.054 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	0.15	164.10	0.005 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	0.10	145.70	0.004 Sb+3
Bi2O3	0.12	233.00	0.003 Bi+3
MnO	0.23	70.94	0.017 Mn+2
FeO	0.10	71.85	0.007 Fe+2
CaO	10.80	56.08	0.998 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.15	223.20	0.003 Pb+2
Na2O	3.87	30.99	0.647 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	2.05	19.00	0.559 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.96		6.237 O
LESS O=F	0.86		
TOTAL	97.10		

A B O (O OH F) . 0.00 H2O
 1.74 2.0 6.00 0.24 0.00 0.56

(O + OH + F) = 0.80 Vacancies: 0.26 A 0.20 Y
 Dose (alphas/mg) = 0.123E+18 DPA (displacements/atom) = 14.9

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

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

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.98

OXIDE	WT %	MOL WT	ATOMS
WO3	0.23	231.80	0.005 W
Ta2O5	67.40	220.90	1.577 Ta
Nb2O5	9.96	132.90	0.387 Nb
TiO2	0.47	79.90	0.030 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	0.04	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	2.74	286.00	0.050 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.03	112.90	0.001 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.16	164.10	0.005 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	0.15	145.70	0.005 Sb+3
Bi2O3	0.06	233.00	0.001 Bi+3
MnO	0.18	70.94	0.013 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.40	56.08	1.051 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.01	153.30	0.000 Ba
PbO	0.12	223.20	0.003 Pb+2
Na2O	4.26	30.99	0.711 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	2.25	19.00	0.612 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.46		6.273 O
LESS O=F	0.94		
TOTAL	98.52		

A B O (O OH F) . 0.00 H2O
 1.84 2.0 6.00 0.27 0.00 0.61

(O + OH + F) = 0.89 Vacancies: 0.16 A 0.11 Y
 Dose (alphas/mg) = 0.112E+18 DPA (displacements/atom) = 13.5

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Sb+3,Ce ,Pb+2,Y ,Bi+3,Th ,Ba ,K
 Mean A valence = 1.73

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.21	231.80	0.005 W
Ta2O5	67.30	220.90	1.592 Ta
Nb2O5	9.51	132.90	0.374 Nb
TiO2	0.43	79.90	0.028 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	0.07	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	2.61	286.00	0.048 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.05	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.24	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	0.16	145.70	0.006 Sb+3
Bi2O3	0.04	233.00	0.001 Bi+3
MnO	0.17	70.94	0.013 Mn+2
FeO	0.17	71.85	0.012 Fe+2
CaO	11.50	56.08	1.072 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.01	153.30	0.000 Ba
PbO	0.12	223.20	0.003 Pb+2
Na2O	3.78	30.99	0.638 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	2.22	19.00	0.611 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	98.61		6.272 O
LESS O=F	0.93		
TOTAL	97.67		

A B O (O OH F) . 0.00 H2O
 1.80 2.0 6.00 0.27 0.00 0.61

(O + OH + F) = 0.88 Vacancies: 0.20 A 0.12 Y
 Dose (alphas/mg) = 0.107E+18 DPA (displacements/atom) = 13.1

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Fe+2,Ce ,Sb+3,Pb+2,Y ,Th ,Bi+3,Ba
 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	0.29	231.80	0.007 W
Ta2O5	74.90	220.90	1.792 Ta
Nb2O5	4.76	132.90	0.189 Nb
TiO2	0.18	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	0.01	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	1.92	286.00	0.035 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.03	112.90	0.001 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	0.24	145.70	0.009 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.14	70.94	0.010 Mn+2
FeO	0.14	71.85	0.010 Fe+2
CaO	11.40	56.08	1.074 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.01	153.30	0.000 Ba
PbO	0.09	223.20	0.002 Pb+2
Na2O	3.73	30.99	0.636 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.01	140.90	0.000 Cs
F	2.39	19.00	0.665 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	100.47		6.214 O
LESS O=F	1.00		
TOTAL	99.46		

A B O (O OH F) . 0.00 H2O
 1.79 2.0 6.00 0.21 0.00 0.66

(O + OH + F) = 0.88 Vacancies: 0.21 A 0.12 Y
 Dose (alphas/mg) = 0.772E+17 DPA (displacements/atom) = 9.7

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 ,Th ,K
 Mean A valence = 1.73

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.28	231.80	0.006 W
Ta2O5	74.40	220.90	1.743 Ta
Nb2O5	6.20	132.90	0.241 Nb
TiO2	0.15	79.90	0.010 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	0.07	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	2.00	286.00	0.036 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	0.15	164.10	0.005 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	0.23	145.70	0.008 Sb+3
Bi2O3	0.08	233.00	0.002 Bi+3
MnO	0.15	70.94	0.011 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.00	56.08	1.015 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.03	153.30	0.001 Ba
PbO	0.08	223.20	0.002 Pb+2
Na2O	4.52	30.99	0.755 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.03	140.90	0.001 Cs
F	2.63	19.00	0.716 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	102.06		6.184 O
LESS O=F	1.10		
TOTAL	100.96		

A B O (O OH F) . 0.00 H2O
 1.84 2.0 6.00 0.18 0.00 0.72

(O + OH + F) = 0.90 Vacancies: 0.16 A 0.10 Y
 Dose (alphas/mg) = 0.794E+17 DPA (displacements/atom) = 9.8

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Sb+3,Ce ,Y ,Pb+2,Bi+3,Th ,Ba ,K
 Mean A valence = 1.68

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.23	231.80	0.005 W
Ta2O5	74.30	220.90	1.751 Ta
Nb2O5	6.08	132.90	0.238 Nb
TiO2	0.08	79.90	0.005 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	0.04	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	1.94	286.00	0.035 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	0.19	164.10	0.006 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	0.15	145.70	0.005 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.32	70.94	0.023 Mn+2
FeO	0.11	71.85	0.008 Fe+2
CaO	11.30	56.08	1.049 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.03	153.30	0.001 Ba
PbO	0.08	223.20	0.002 Pb+2
Na2O	4.18	30.99	0.702 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.03	140.90	0.001 Cs
F	2.52	19.00	0.691 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	101.66		6.220 O
LESS O=F	1.06		
TOTAL	100.60		

A B O (O OH F) . 0.00 H2O
 1.84 2.0 6.00 0.22 0.00 0.69

(O + OH + F) = 0.91 Vacancies: 0.16 A 0.09 Y
 Dose (alphas/mg) = 0.772E+17 DPA (displacements/atom) = 9.6

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Fe+2,Ce ,Sb+3,Y ,Pb+2,Ba ,Th ,K
 Mean A valence = 1.70

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

OXIDE	WT %	MOL WT	ATOMS
W03	0.30	231.80	0.007 W
Ta205	74.40	220.90	1.766 Ta
Nb205	5.60	132.90	0.221 Nb
Ti02	0.09	79.90	0.006 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	2.10	286.00	0.038 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.04	112.90	0.002 Y
La203	0.00	162.90	0.000 La
Ce203	0.17	164.10	0.005 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	0.19	145.70	0.007 Sb+3
Bi203	0.07	233.00	0.002 Bi+3
Mn0	0.30	70.94	0.022 Mn+2
Fe0	0.13	71.85	0.009 Fe+2
Ca0	11.50	56.08	1.075 Ca
Sr0	0.00	103.60	0.000 Sr
Ba0	0.00	153.30	0.000 Ba
Pb0	0.12	223.20	0.003 Pb+2
Na20	3.94	30.99	0.667 Na
K20	0.00	47.10	0.000 K
Cs20	0.00	140.90	0.000 Cs
F	2.52	19.00	0.696 F
H20+	0.00	9.01	0.000 OH
H20-	0.00	18.02	0.000 H2O
TOTAL	101.48		6.235 O
LESS O=F	1.06		
TOTAL	100.42		

A B O (O OH F) . 0.00 H2O
 1.83 2.0 6.00 0.24 0.00 0.70

(O + OH + F) = 0.93 Vacancies: 0.17 A 0.07 Y
 Dose (alphas/mg) = 0.837E+17 DPA (displacements/atom) = 10.4

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 ,Bi+3,Th ,K
 Mean A valence = 1.73

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.19	231.80	0.004 W
Ta2O5	74.80	220.90	1.781 Ta
Nb2O5	5.35	132.90	0.212 Nb
TiO2	0.05	79.90	0.003 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	0.06	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	0.10	286.00	0.002 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.04	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.15	164.10	0.005 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	0.13	145.70	0.005 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.03	70.94	0.002 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	10.50	56.08	0.985 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.01	223.20	0.000 Pb+2
Na2O	5.22	30.99	0.886 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	3.27	19.00	0.905 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.90		6.003 O
LESS O=F	1.37		
TOTAL	98.52		

A B O (O OH F) . 0.00 H2O
 1.89 2.0 6.00 0.00 0.00 0.91

(O + OH + F) = 0.91 Vacancies: 0.11 A 0.09 Y
 Dose (alphas/mg) = 0.388E+16 DPA (displacements/atom) = 0.5

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,Ce ,Sb+3,Mn+2,Y ,U+6 ,Th ,Pb+2,K ,Sm ,U+8
 Mean A valence = 1.54

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

OXIDE	WT %	MOL WT	ATOMS
W03	0.26	231.80	0.006 W
Ta205	74.90	220.90	1.767 Ta
Nb205	5.74	132.90	0.225 Nb
Ti02	0.03	79.90	0.002 Ti
Zr02	0.00	123.20	0.000 Zr
Sn02	0.01	150.70	0.000 Sn
Fe203	0.00	159.70	0.000 Fe+3
Th02	0.08	264.00	0.002 Th
U02	0.00	270.00	0.000 U+4
U03	0.00	286.00	0.000 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.04	112.90	0.002 Y
La203	0.00	162.90	0.000 La
Ce203	0.22	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	0.15	145.70	0.005 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
Mn0	0.07	70.94	0.005 Mn+2
Fe0	0.00	71.85	0.000 Fe+2
Ca0	10.80	56.08	1.003 Ca
Sr0	0.00	103.60	0.000 Sr
Ba0	0.00	153.30	0.000 Ba
Pb0	0.00	223.20	0.000 Pb+2
Na20	5.29	30.99	0.889 Na
K20	0.00	47.10	0.000 K
Cs20	0.03	140.90	0.001 Cs
F	3.35	19.00	0.919 F
H20+	0.00	9.01	0.000 OH
H20-	0.00	18.02	0.000 H2O
TOTAL	100.97		6.021 O
LESS O=F	1.41		
TOTAL	99.56		

A B O (O OH F) . 0.00 H2O
 1.92 2.0 6.00 0.02 0.00 0.92

(O + OH + F) = 0.94 Vacancies: 0.08 A 0.06 Y
 Dose (alphas/mg) = 0.000E+00 DPA (displacements/atom) = 0.0

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,Ce ,Sb+3,Mn+2,Y ,Th ,K ,Pr ,Nd ,Sm ,U+8
 Mean A valence = 1.54

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.25	231.80	0.006 W
Ta2O5	75.00	220.90	1.784 Ta
Nb2O5	5.26	132.90	0.208 Nb
TiO2	0.00	79.90	0.000 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.08	150.70	0.003 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	0.03	286.00	0.001 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.05	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.05	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	0.12	145.70	0.004 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.10	70.94	0.007 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	10.80	56.08	1.012 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.04	223.20	0.001 Pb+2
Na2O	5.22	30.99	0.885 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.02	140.90	0.001 Cs
F	3.39	19.00	0.937 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	100.41		6.010 O
LESS O=F	1.42		
TOTAL	98.99		

A B O (O OH F) . 0.00 H2O
 1.91 2.0 6.00 0.01 0.00 0.94

(O + OH + F) = 0.95 Vacancies: 0.09 A 0.05 Y
 Dose (alphas/mg) = 0.129E+16 DPA (displacements/atom) = 0.2

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,Mn+2,Sb+3,Y ,Ce ,Pb+2,U+6 ,K ,Nd ,Sm ,U+8
 Mean A valence = 1.54

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.23	231.80	0.005 W
Ta2O5	74.70	220.90	1.770 Ta
Nb2O5	5.64	132.90	0.222 Nb
TiO2	0.02	79.90	0.001 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.05	150.70	0.002 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.04	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	0.03	286.00	0.001 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.02	112.90	0.001 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.10	164.10	0.003 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	0.14	145.70	0.005 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.04	70.94	0.003 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	10.80	56.08	1.008 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.02	223.20	0.000 Pb+2
Na2O	5.40	30.99	0.912 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	3.36	19.00	0.925 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	100.59		6.023 O
LESS O=F	1.41		
TOTAL	99.18		

A B O (O OH F) . 0.00 H2O
 1.93 2.0 6.00 0.02 0.00 0.93

(O + OH + F) = 0.95 Vacancies: 0.07 A 0.05 Y
 Dose (alphas/mg) = 0.128E+16 DPA (displacements/atom) = 0.2

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,Sb+3,Ce ,Mn+2,Y ,Th ,U+6 ,Pb+2,K ,Sm ,Pr
 Mean A valence = 1.54

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.25	231.80	0.006 W
Ta2O5	75.20	220.90	1.776 Ta
Nb2O5	5.51	132.90	0.216 Nb
TiO2	0.02	79.90	0.001 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.03	150.70	0.001 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.05	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	0.00	286.00	0.000 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.02	112.90	0.001 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.12	164.10	0.004 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	0.12	145.70	0.004 Sb+3
Bi2O3	0.02	233.00	0.000 Bi+3
MnO	0.02	70.94	0.001 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.10	56.08	1.032 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.03	223.20	0.001 Pb+2
Na2O	5.57	30.99	0.938 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	3.40	19.00	0.933 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	101.46		6.055 O
LESS O=F	1.43		
TOTAL	100.03		

A B O (O OH F) . 0.00 H2O
 1.98 2.0 6.00 0.05 0.00 0.93

(O + OH + F) = 0.99 Vacancies: 0.02 A 0.01 Y
 Dose (alphas/mg) = 0.000E+00 DPA (displacements/atom) = 0.0

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,Sb+3,Ce ,Mn+2,Th ,Y ,Pb+2,Bi+3,K ,Sm ,U+6
 Mean A valence = 1.53

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

Microcline-Spodumene Zone = "Spotted Rock"

P13.1

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	67.70	220.90	1.674 Ta
Nb2O5	6.19	132.90	0.254 Nb
TiO2	1.05	79.90	0.072 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	0.03	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	7.58	286.00	0.145 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.07	112.90	0.003 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.12	164.10	0.004 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	0.04	145.70	0.001 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.40	70.94	0.031 Mn+2
FeO	0.01	71.85	0.001 Fe+2
CaO	10.10	56.08	0.984 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.03	153.30	0.001 Ba
PbO	0.20	223.20	0.005 Pb+2
Na2O	3.93	30.99	0.693 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.91	19.00	0.549 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.36		6.506 O
LESS O=F	0.80		
TOTAL	98.56		

A B O (O OH F) . 0.00 H2O
 1.87 2.0 6.00 0.51 0.00 0.55

(O + OH + F) = 1.06 Vacancies: 0.13 A -.06 Y
 Dose (alphas/mg) = 0.308E+18 DPA (displacements/atom) = 39.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Ce ,Y ,Sb+3,Ba ,Fe+2,Th ,K
 Mean A valence = 1.94

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.96

P13.1

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	68.90	220.90	1.713 Ta
Nb2O5	5.14	132.90	0.212 Nb
TiO2	1.09	79.90	0.075 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	0.03	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	7.40	286.00	0.142 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.07	112.90	0.003 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.06	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	0.03	233.00	0.001 Bi+3
MnO	0.01	70.94	0.001 Mn+2
FeO	0.03	71.85	0.002 Fe+2
CaO	9.97	56.08	0.976 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.03	153.30	0.001 Ba
PbO	0.18	223.20	0.004 Pb+2
Na2O	3.83	30.99	0.679 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.03	140.90	0.001 Cs
F	1.80	19.00	0.520 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	98.69		6.469 O
LESS O=F	0.76		
TOTAL	97.94		

A B O (O OH F) . 0.00 H2O
 1.82 2.0 6.00 0.47 0.00 0.52

(O + OH + F) = 0.99 Vacancies: 0.18 A 0.01 Y
 Dose (alphas/mg) = 0.303E+18 DPA (displacements/atom) = 39.2

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Pb+2,Y ,Sb+3,Fe+2,Ce ,Ba ,Mn+2,Bi+3,Th
 Mean A valence = 1.94

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.96

OXIDE	WT %	MOL WT	ATOMS
WO3	0.02	231.80	0.000 W
Ta2O5	66.10	220.90	1.661 Ta
Nb2O5	6.33	132.90	0.264 Nb
TiO2	1.07	79.90	0.074 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	0.02	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	7.36	286.00	0.143 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	0.01	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	0.06	145.70	0.002 Sb+3
Bi2O3	0.01	233.00	0.000 Bi+3
MnO	0.39	70.94	0.031 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	10.70	56.08	1.059 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.04	153.30	0.001 Ba
PbO	0.19	223.20	0.005 Pb+2
Na2O	3.63	30.99	0.650 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.02	140.90	0.001 Cs
F	2.03	19.00	0.593 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	98.04		6.526 O
LESS O=F	0.85		
TOTAL	97.19		

A B O (O OH F) . 0.00 H2O
 1.90 2.0 6.00 0.53 0.00 0.59

(O + OH + F) = 1.12 Vacancies: 0.10 A -.12 Y
 Dose (alphas/mg) = 0.303E+18 DPA (displacements/atom) = 38.9

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Y ,Sb+3,Ba ,Th ,Ce ,Bi+3,K
 Mean A valence = 1.96

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.96

OXIDE	WT %	MOL WT	ATOMS
W03	0.00	231.80	0.000 W
Ta205	68.40	220.90	1.714 Ta
Nb205	4.96	132.90	0.207 Nb
Ti02	1.15	79.90	0.080 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	0.02	264.00	0.000 Th
U02	0.00	270.00	0.000 U+4
U03	7.02	286.00	0.136 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.06	112.90	0.003 Y
La203	0.00	162.90	0.000 La
Ce203	0.07	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	0.09	145.70	0.003 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
Mn0	0.29	70.94	0.023 Mn+2
Fe0	0.00	71.85	0.000 Fe+2
Ca0	10.90	56.08	1.076 Ca
Sr0	0.00	103.60	0.000 Sr
Ba0	0.00	153.30	0.000 Ba
Pb0	0.28	223.20	0.007 Pb+2
Na20	3.08	30.99	0.550 Na
K20	0.00	47.10	0.000 K
Cs20	0.01	140.90	0.000 Cs
F	1.64	19.00	0.478 F
H20+	0.00	9.01	0.000 OH
H20-	0.00	18.02	0.000 H2O
TOTAL	97.97		6.524 O
LESS O=F	0.69		
TOTAL	97.28		

A B O (O OH F) . 0.00 H2O
 1.80 2.0 6.00 0.52 0.00 0.48

(O + OH + F) = 1.00 Vacancies: 0.20 A 0.00 Y
 Dose (alphas/mg) = 0.289E+18 DPA (displacements/atom) = 37.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

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

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.96

P13.1

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	67.80	220.90	1.683 Ta
Nb2O5	6.61	132.90	0.273 Nb
TiO2	0.63	79.90	0.043 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.03	150.70	0.001 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.01	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	6.56	286.00	0.126 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.07	112.90	0.003 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.03	164.10	0.001 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	0.12	145.70	0.005 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.24	70.94	0.019 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	9.86	56.08	0.964 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.04	153.30	0.001 Ba
PbO	0.23	223.20	0.006 Pb+2
Na2O	3.33	30.99	0.589 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.04	140.90	0.002 Cs
F	1.57	19.00	0.453 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.17		6.427 O
LESS O=F	0.66		
TOTAL	96.51		

A B O (O OH F) . 0.00 H2O
 1.72 2.0 6.00 0.43 0.00 0.45

(O + OH + F) = 0.88 Vacancies: 0.28 A 0.12 Y
 Dose (alphas/mg) = 0.272E+18 DPA (displacements/atom) = 35.3

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Sb+3,Y ,Ba ,Ce ,Th ,K ,La
 Mean A valence = 1.95

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.98

OXIDE	WT %	MOL WT	ATOMS	
W03	0.26	231.80	0.006	W
Ta205	69.00	220.90	1.705	Ta
Nb205	6.87	132.90	0.282	Nb
Ti02	0.09	79.90	0.006	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	0.02	264.00	0.000	Th
U02	0.00	270.00	0.000	U+4
U03	6.05	286.00	0.115	U+6
U308	0.00	842.00	0.000	U+8
Y203	0.06	112.90	0.003	Y
La203	0.00	162.90	0.000	La
Ce203	0.02	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	0.07	145.70	0.003	Sb+3
Bi203	0.06	233.00	0.001	Bi+3
Mn0	0.08	70.94	0.006	Mn+2
Fe0	0.00	71.85	0.000	Fe+2
Ca0	8.39	56.08	0.817	Ca
Sr0	0.00	103.60	0.000	Sr
Ba0	0.00	153.30	0.000	Ba
Pb0	0.43	223.20	0.011	Pb+2
Na20	4.11	30.99	0.724	Na
K20	0.00	47.10	0.000	K
Cs20	0.06	140.90	0.002	Cs
F	1.18	19.00	0.339	F
H20+	0.00	9.01	0.000	OH
H20-	0.00	18.02	0.000	H2O
TOTAL	96.75		6.386	O
LESS O=F	0.50			
TOTAL	96.25			

A B O (O OH F) . 0.00 H2O
 1.68 2.0 6.00 0.39 0.00 0.34

(O + OH + F) = 0.72 Vacancies: 0.32 A 0.28 Y
 Dose (alphas/mg) = 0.252E+18 DPA (displacements/atom) = 32.9

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Pb+2,Mn+2,Y ,Sb+3,Bi+3,Ce ,Th ,K ,Nd
 Mean A valence = 1.85

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.08	231.80	0.002 W
Ta2O5	66.00	220.90	1.634 Ta
Nb2O5	8.73	132.90	0.359 Nb
TiO2	0.07	79.90	0.005 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	0.02	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	6.49	286.00	0.124 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.04	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.05	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	0.06	145.70	0.002 Sb+3
Bi2O3	0.02	233.00	0.000 Bi+3
MnO	0.23	70.94	0.018 Mn+2
FeO	0.01	71.85	0.001 Fe+2
CaO	10.10	56.08	0.985 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.19	223.20	0.005 Pb+2
Na2O	4.06	30.99	0.717 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.07	140.90	0.003 Cs
F	1.64	19.00	0.472 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.86		6.513 O
LESS O=F	0.69		
TOTAL	97.17		

A B O (O OH F) . 0.00 H2O
 1.86 2.0 6.00 0.51 0.00 0.47

(O + OH + F) = 0.99 Vacancies: 0.14 A 0.01 Y
 Dose (alphas/mg) = 0.268E+18 DPA (displacements/atom) = 34.3

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Sb+3,Y ,Ce ,Fe+2,Bi+3,Th ,K
 Mean A valence = 1.88

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

OXIDE	WT %	MOL WT	ATOMS
W03	0.16	231.80	0.004 W
Ta205	69.90	220.90	1.700 Ta
Nb205	7.32	132.90	0.296 Nb
Ti02	0.01	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	0.02	264.00	0.000 Th
U02	0.00	270.00	0.000 U+4
U03	5.38	286.00	0.101 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.05	112.90	0.002 Y
La203	0.00	162.90	0.000 La
Ce203	0.08	164.10	0.003 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	0.04	145.70	0.001 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
Mn0	0.00	70.94	0.000 Mn+2
Fe0	0.02	71.85	0.001 Fe+2
Ca0	8.33	56.08	0.798 Ca
Sr0	0.00	103.60	0.000 Sr
Ba0	0.02	153.30	0.001 Ba
Pb0	0.29	223.20	0.007 Pb+2
Na20	3.83	30.99	0.664 Na
K20	0.00	47.10	0.000 K
Cs20	0.06	140.90	0.002 Cs
F	1.20	19.00	0.339 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.71		6.286 O
LESS O=F	0.50		
TOTAL	96.21		

A B O (O OH F) . 0.00 H2O
 1.58 2.0 6.00 0.29 0.00 0.34

(O + OH + F) = 0.63 Vacancies: 0.42 A 0.37 Y
 Dose (alphas/mg) = 0.224E+18 DPA (displacements/atom) = 29.1

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Pb+2,Ce ,Y ,Fe+2,Sb+3,Ba ,Th ,K ,Pr
 Mean A valence = 1.84

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.16	231.80	0.004 W
Ta2O5	68.70	220.90	1.658 Ta
Nb2O5	8.42	132.90	0.338 Nb
TiO2	0.00	79.90	0.000 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	4.94	286.00	0.092 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.05	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.10	164.10	0.003 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	0.06	145.70	0.002 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.09	70.94	0.007 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	9.25	56.08	0.880 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.01	153.30	0.000 Ba
PbO	0.19	223.20	0.005 Pb+2
Na2O	4.53	30.99	0.780 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.04	140.90	0.002 Cs
F	1.73	19.00	0.486 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	98.27		6.329 O
LESS O=F	0.73		
TOTAL	97.54		

A B O (O OH F) . 0.00 H2O
 1.77 2.0 6.00 0.33 0.00 0.49

(O + OH + F) = 0.81 Vacancies: 0.23 A 0.19 Y
 Dose (alphas/mg) = 0.203E+18 DPA (displacements/atom) = 25.6

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

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

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.13	231.80	0.003 W
Ta2O5	69.00	220.90	1.793 Ta
Nb2O5	4.48	132.90	0.194 Nb
TiO2	0.12	79.90	0.009 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.03	150.70	0.001 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.03	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	5.48	286.00	0.110 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.04	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.10	164.10	0.003 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	0.05	145.70	0.002 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	1.15	70.94	0.093 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.20	56.08	1.147 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.01	153.30	0.000 Ba
PbO	0.22	223.20	0.006 Pb+2
Na2O	2.69	30.99	0.498 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.03	140.90	0.001 Cs
F	1.74	19.00	0.526 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.50		6.572 O
LESS O=F	0.73		
TOTAL	95.77		

A B O (O OH F) . 0.00 H2O
 1.86 2.0 6.00 0.57 0.00 0.53

(O + OH + F) = 1.10 Vacancies: 0.14 A -.10 Y
 Dose (alphas/mg) = 0.229E+18 DPA (displacements/atom) = 30.2

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Ce ,Y ,Sb+3,Th ,Ba ,K ,Pr
 Mean A valence = 1.97

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

OXIDE	WT %	MOL WT	ATOMS	
WO3	0.01	231.80	0.000	W
Ta2O5	65.90	220.90	1.652	Ta
Nb2O5	8.32	132.90	0.347	Nb
TiO2	0.00	79.90	0.000	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	0.00	264.00	0.000	Th
UO2	0.00	270.00	0.000	U+4
UO3	4.44	286.00	0.086	U+6
U3O8	0.00	842.00	0.000	U+8
Y2O3	0.05	112.90	0.002	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	0.04	145.70	0.002	Sb+3
Bi2O3	0.00	233.00	0.000	Bi+3
MnO	0.97	70.94	0.076	Mn+2
FeO	0.00	71.85	0.000	Fe+2
CaO	11.50	56.08	1.136	Ca
SrO	0.00	103.60	0.000	Sr
BaO	0.00	153.30	0.000	Ba
PbO	0.20	223.20	0.005	Pb+2
Na2O	3.00	30.99	0.536	Na
K2O	0.00	47.10	0.000	K
Cs2O	0.03	140.90	0.001	Cs
F	1.70	19.00	0.496	F
H2O+	0.00	9.01	0.000	OH
H2O-	0.00	18.02	0.000	H2O
TOTAL	96.25		6.504	O
LESS O=F	0.71			
TOTAL	95.53			

A B O (O OH F) . 0.00 H2O
 1.85 2.0 6.00 0.50 0.00 0.50

(O + OH + F) = 1.00 Vacancies: 0.15 A 0.00 Y
 Dose (alphas/mg) = 0.186E+18 DPA (displacements/atom) = 23.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Y ,Ce ,Sb+3,K ,Nd ,Sm ,Pr
 Mean A valence = 1.90

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.08	231.80	0.002 W
Ta2O5	68.10	220.90	1.715 Ta
Nb2O5	6.75	132.90	0.283 Nb
TiO2	0.00	79.90	0.000 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	0.02	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	4.05	286.00	0.079 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.07	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	0.06	145.70	0.002 Sb+3
Bi2O3	0.05	233.00	0.001 Bi+3
MnO	0.54	70.94	0.042 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.40	56.08	1.131 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.19	223.20	0.005 Pb+2
Na2O	3.18	30.99	0.571 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.06	140.90	0.002 Cs
F	1.68	19.00	0.492 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.30		6.471 O
LESS O=F	0.71		
TOTAL	95.59		

A B O (O OH F) . 0.00 H2O
 1.84 2.0 6.00 0.47 0.00 0.49

(O + OH + F) = 0.96 Vacancies: 0.16 A 0.04 Y
 Dose (alphas/mg) = 0.170E+18 DPA (displacements/atom) = 21.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Y ,Ce ,Sb+3,Bi+3,Th ,K ,Pr
 Mean A valence = 1.87

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	66.30	220.90	1.717 Ta
Nb2O5	6.54	132.90	0.282 Nb
TiO2	0.02	79.90	0.001 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	0.04	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	5.30	286.00	0.106 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.04	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.12	164.10	0.004 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	0.04	145.70	0.002 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.84	70.94	0.068 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.60	56.08	1.183 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	3.02	30.99	0.558 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.04	140.90	0.002 Cs
F	1.65	19.00	0.497 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	95.76		6.618 O
LESS O=F	0.69		
TOTAL	95.06		

A B O (O OH F) . 0.00 H2O
 1.93 2.0 6.00 0.62 0.00 0.50

(O + OH + F) = 1.11 Vacancies: 0.07 A -.11 Y
 Dose (alphas/mg) = 0.223E+18 DPA (displacements/atom) = 29.0

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Ce ,Y ,Sb+3,Th ,K ,Sm ,Pr
 Mean A valence = 1.93

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

OXIDE	WT %	MOL WT	ATOMS
W03	0.27	231.80	0.006 W
Ta205	66.50	220.90	1.660 Ta
Nb205	7.85	132.90	0.326 Nb
Ti02	0.12	79.90	0.008 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	8.21	286.00	0.158 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.04	112.90	0.002 Y
La203	0.00	162.90	0.000 La
Ce203	0.19	164.10	0.006 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	0.07	145.70	0.003 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
MnO	0.19	70.94	0.015 Mn+2
FeO	0.02	71.85	0.002 Fe+2
CaO	9.23	56.08	0.907 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.25	223.20	0.006 Pb+2
Na2O	3.95	30.99	0.703 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.02	140.90	0.001 Cs
F	1.47	19.00	0.427 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	98.38		6.559 O
LESS O=F	0.62		
TOTAL	97.76		

A B O (O OH F) . 0.00 H2O
 1.80 2.0 6.00 0.56 0.00 0.43

(O + OH + F) = 0.99 Vacancies: 0.20 A 0.01 Y
 Dose (alphas/mg) = 0.336E+18 DPA (displacements/atom) = 44.1

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Pb+2,Sb+3,Y ,Fe+2,K ,Sm ,Pr
 Mean A valence = 1.97

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	63.70	220.90	1.578 Ta
Nb2O5	10.00	132.90	0.412 Nb
TiO2	0.13	79.90	0.009 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	0.00	264.00	0.000 Th
UO2	0.00	270.00	0.000 U+4
UO3	8.44	286.00	0.162 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.04	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.16	164.10	0.005 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	0.10	145.70	0.004 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.08	70.94	0.006 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	9.19	56.08	0.897 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.27	223.20	0.007 Pb+2
Na2O	4.25	30.99	0.751 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.02	140.90	0.001 Cs
F	1.54	19.00	0.444 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.94		6.560 O
LESS O=F	0.65		
TOTAL	97.30		

A B O (O OH F) . 0.00 H2O
 1.83 2.0 6.00 0.56 0.00 0.44

(O + OH + F) = 1.00 Vacancies: 0.17 A 0.00 Y
 Dose (alphas/mg) = 0.348E+18 DPA (displacements/atom) = 44.9

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Pb+2,Mn+2,Ce ,Sb+3,Y ,K ,Nd ,Sm ,La
 Mean A valence = 1.95

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

P17.1

OXIDE	WT %	MOL WT	ATOMS
W03	0.11	231.80	0.003 W
Ta205	62.70	220.90	1.574 Ta
Nb205	9.95	132.90	0.415 Nb
Ti02	0.11	79.90	0.008 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	8.59	286.00	0.167 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	0.16	164.10	0.005 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	0.08	145.70	0.003 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
MnO	0.06	70.94	0.005 Mn+2
FeO	0.06	71.85	0.005 Fe+2
CaO	9.18	56.08	0.908 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.35	223.20	0.009 Pb+2
Na2O	3.69	30.99	0.660 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.01	140.90	0.000 Cs
F	1.33	19.00	0.388 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.45		6.578 O
LESS O=F	0.56		
TOTAL	95.89		

A B O (O OH F) . 0.00 H2O
 1.77 2.0 6.00 0.58 0.00 0.39

(O + OH + F) = 0.97 Vacancies: 0.23 A 0.03 Y
 Dose (alphas/mg) = 0.359E+18 DPA (displacements/atom) = 46.8

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

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

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

OXIDE	WT %	MOL WT	ATOMS
W03	0.15	231.80	0.004 W
Ta205	61.50	220.90	1.570 Ta
Nb205	9.81	132.90	0.416 Nb
Ti02	0.14	79.90	0.010 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	8.30	286.00	0.164 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.05	112.90	0.002 Y
La203	0.00	162.90	0.000 La
Ce203	0.15	164.10	0.005 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	0.08	145.70	0.003 Sb+3
Bi203	0.03	233.00	0.001 Bi+3
Mn0	0.18	70.94	0.014 Mn+2
Fe0	0.05	71.85	0.004 Fe+2
Ca0	9.38	56.08	0.943 Ca
Sr0	0.00	103.60	0.000 Sr
Ba0	0.00	153.30	0.000 Ba
Pb0	0.28	223.20	0.007 Pb+2
Na20	3.67	30.99	0.668 Na
K20	0.00	47.10	0.000 K
Cs20	0.00	140.90	0.000 Cs
F	1.43	19.00	0.424 F
H20+	0.00	9.01	0.000 OH
H20-	0.00	18.02	0.000 H2O
TOTAL	95.20		6.596 O
LESS O=F	0.60		
TOTAL	94.60		

A B O (O OH F) . 0.00 H2O
 1.81 2.0 6.00 0.60 0.00 0.42

(O + OH + F) = 1.02 Vacancies: 0.19 A -.02 Y
 Dose (alphas/mg) = 0.352E+18 DPA (displacements/atom) = 45.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

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

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.14	231.80	0.004 W
Ta2O5	61.20	220.90	1.616 Ta
Nb2O5	8.15	132.90	0.358 Nb
TiO2	0.32	79.90	0.023 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	7.93	286.00	0.162 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.05	112.90	0.003 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.23	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	0.12	145.70	0.005 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	1.18	70.94	0.097 Mn+2
FeO	0.01	71.85	0.001 Fe+2
CaO	12.10	56.08	1.258 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.18	223.20	0.005 Pb+2
Na2O	2.68	30.99	0.504 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.78	19.00	0.546 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.07		6.838 O
LESS O=F	0.75		
TOTAL	95.33		

A B O (O OH F) . 0.00 H2O
 2.04 2.0 6.00 0.84 0.00 0.55

(O + OH + F) = 1.38 Vacancies: -.04 A -.38 Y
 Dose (alphas/mg) = 0.333E+18 DPA (displacements/atom) = 43.6

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Sb+3,Pb+2,Y ,Fe+2,K ,Sm ,La
 Mean A valence = 2.08

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

P17.1

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	60.00	220.90	1.592 Ta
Nb2O5	8.63	132.90	0.381 Nb
TiO2	0.38	79.90	0.028 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	8.64	286.00	0.177 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.03	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.25	164.10	0.009 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	0.13	145.70	0.005 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	1.92	70.94	0.159 Mn+2
FeO	0.02	71.85	0.002 Fe+2
CaO	12.10	56.08	1.264 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.27	223.20	0.007 Pb+2
Na2O	2.25	30.99	0.425 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.31	19.00	0.404 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	95.93		6.983 O
LESS O=F	0.55		
TOTAL	95.38		

A B O (O OH F) . 0.00 H2O
 2.05 2.0 6.00 0.98 0.00 0.40

(O + OH + F) = 1.39 Vacancies: -.05 A -.39 Y
 Dose (alphas/mg) = 0.363E+18 DPA (displacements/atom) = 48.3

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Pb+2,Sb+3,Fe+2,Y ,K ,Sm ,Nd
 Mean A valence = 2.15

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

P17.1

OXIDE	WT %	MOL WT	ATOMS
W03	0.00	231.80	0.000 W
Ta2O5	60.10	220.90	1.592 Ta
Nb2O5	8.37	132.90	0.369 Nb
TiO2	0.54	79.90	0.040 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	8.36	286.00	0.171 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	0.11	164.10	0.004 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	0.004 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	1.15	70.94	0.095 Mn+2
FeO	0.02	71.85	0.002 Fe+2
CaO	11.80	56.08	1.231 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.24	223.20	0.006 Pb+2
Na2O	2.93	30.99	0.553 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.76	19.00	0.542 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	95.55		6.850 O
LESS O=F	0.74		
TOTAL	94.81		

A B O (O OH F) . 0.00 H2O
 2.07 2.0 6.00 0.85 0.00 0.54

(O + OH + F) = 1.39 Vacancies: -.07 A -.39 Y
 Dose (alphas/mg) = 0.353E+18 DPA (displacements/atom) = 46.0

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Y ,Ce ,Sb+3,Fe+2,K ,Sm ,Pr
 Mean A valence = 2.07

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.98

OXIDE	WT %	MOL WT	ATOMS
WO3	0.04	231.80	0.001 W
Ta2O5	61.10	220.90	1.586 Ta
Nb2O5	9.15	132.90	0.395 Nb
TiO2	0.26	79.90	0.019 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	7.65	286.00	0.153 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.04	112.90	0.002 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.15	164.10	0.005 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	0.07	145.70	0.003 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	1.05	70.94	0.085 Mn+2
FeO	0.03	71.85	0.002 Fe+2
CaO	11.60	56.08	1.186 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.19	223.20	0.005 Pb+2
Na2O	3.01	30.99	0.557 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.61	19.00	0.486 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	95.95		6.780 O
LESS O=F	0.68		
TOTAL	95.27		

A B O (O OH F) . 0.00 H2O
 2.00 2.0 6.00 0.78 0.00 0.49

(O + OH + F) = 1.27 Vacancies: 0.00 A -.27 Y
 Dose (alphas/mg) = 0.322E+18 DPA (displacements/atom) = 41.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Pb+2,Sb+3,Fe+2,Y ,K ,Sm ,Nd
 Mean A valence = 2.03

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.03	231.80	0.001 W
Ta2O5	63.10	220.90	1.627 Ta
Nb2O5	7.05	132.90	0.302 Nb
TiO2	0.98	79.90	0.070 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	0.03	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	9.90	286.00	0.197 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	0.17	164.10	0.006 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	0.05	145.70	0.002 Sb+3
Bi2O3	0.05	233.00	0.001 Bi+3
MnO	0.01	70.94	0.001 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	8.71	56.08	0.885 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.26	223.20	0.007 Pb+2
Na2O	3.60	30.99	0.662 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.34	19.00	0.402 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	95.36		6.600 O
LESS O=F	0.56		
TOTAL	94.80		

A B O (O OH F) . 0.00 H2O
 1.76 2.0 6.00 0.60 0.00 0.40

(O + OH + F) = 1.00 Vacancies: 0.24 A 0.00 Y
 Dose (alphas/mg) = 0.419E+18 DPA (displacements/atom) = 55.4

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Pb+2,Ce ,Y ,Sb+3,Bi+3,Mn+2,Th ,K ,La
 Mean A valence = 2.08

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.97

OXIDE	WT %	MOL WT	ATOMS
WO3	0.15	231.80	0.004 W
Ta2O5	62.50	220.90	1.602 Ta
Nb2O5	7.58	132.90	0.323 Nb
TiO2	1.00	79.90	0.071 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.01	150.70	0.000 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	10.21	286.00	0.202 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	0.18	164.10	0.006 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	0.07	145.70	0.003 Sb+3
Bi2O3	0.06	233.00	0.001 Bi+3
MnO	0.35	70.94	0.028 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	9.56	56.08	0.965 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.32	223.20	0.008 Pb+2
Na2O	3.51	30.99	0.641 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.02	140.90	0.001 Cs
F	1.65	19.00	0.492 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.29		6.672 O
LESS O=F	0.69		
TOTAL	96.60		

A B O (O OH F) . 0.00 H2O
 1.86 2.0 6.00 0.67 0.00 0.49

(O + OH + F) = 1.16 Vacancies: 0.14 A -.16 Y
 Dose (alphas/mg) = 0.423E+18 DPA (displacements/atom) = 55.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

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

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.97

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	63.20	220.90	1.622 Ta
Nb2O5	7.11	132.90	0.303 Nb
TiO2	1.03	79.90	0.073 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.03	150.70	0.001 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	10.80	286.00	0.214 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	0.19	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	0.05	145.70	0.002 Sb+3
Bi2O3	0.05	233.00	0.001 Bi+3
MnO	0.13	70.94	0.010 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	9.02	56.08	0.912 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.03	153.30	0.001 Ba
PbO	0.28	223.20	0.007 Pb+2
Na2O	3.17	30.99	0.580 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.02	140.90	0.001 Cs
F	1.15	19.00	0.343 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.32		6.674 O
LESS O=F	0.48		
TOTAL	95.84		

A B O (O OH F) . 0.00 H2O
 1.74 2.0 6.00 0.67 0.00 0.34

(O + OH + F) = 1.02 Vacancies: 0.26 A -.02 Y
 Dose (alphas/mg) = 0.452E+18 DPA (displacements/atom) = 60.6

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Ce ,Y ,Sb+3,Bi+3,Ba ,K ,Pr
 Mean A valence = 2.17

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.96

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	58.90	220.90	1.547 Ta
Nb2O5	8.55	132.90	0.373 Nb
TiO2	1.10	79.90	0.080 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	10.34	286.00	0.210 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.07	112.90	0.004 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.23	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	0.00	145.70	0.000 Sb+3
Bi2O3	0.01	233.00	0.000 Bi+3
MnO	0.77	70.94	0.063 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	12.00	56.08	1.241 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.18	223.20	0.005 Pb+2
Na2O	2.43	30.99	0.455 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.02	140.90	0.001 Cs
F	1.63	19.00	0.498 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.23		6.895 O
LESS O=F	0.68		
TOTAL	95.54		

A B O (O OH F) . 0.00 H2O
 1.99 2.0 6.00 0.90 0.00 0.50

(O + OH + F) = 1.39 Vacancies: 0.01 A -.39 Y
 Dose (alphas/mg) = 0.433E+18 DPA (displacements/atom) = 57.1

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Pb+2,Y ,Bi+3,K ,Nd ,Sm ,Sb+3
 Mean A valence = 2.20

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.96

P18.1

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	59.80	220.90	1.577 Ta
Nb2O5	7.87	132.90	0.345 Nb
TiO2	1.07	79.90	0.078 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	10.11	286.00	0.206 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.07	112.90	0.004 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.24	164.10	0.009 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	0.05	145.70	0.002 Sb+3
Bi2O3	0.01	233.00	0.000 Bi+3
MnO	0.79	70.94	0.065 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.70	56.08	1.215 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.20	223.20	0.005 Pb+2
Na2O	2.40	30.99	0.451 Na
K2O	0.00	47.10	0.000 K
Cs2O	1.63	140.90	0.067 Cs
F	0.00	19.00	0.000 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	95.94		7.145 O
LESS O=F	0.00		
TOTAL	95.94		

A B O (O OH F) . 0.00 H2O
 2.02 2.0 6.00 1.14 0.00 0.00

(O + OH + F) = 1.14 Vacancies: -.02 A -.14 Y
 Dose (alphas/mg) = 0.422E+18 DPA (displacements/atom) = 58.6

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Pb+2,Y ,Sb+3,Bi+3,K ,Sm ,Pr
 Mean A valence = 2.16

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.96

OXIDE	WT %	MOL WT	ATOMS
W03	0.00	231.80	0.000 W
Ta205	62.50	220.90	1.614 Ta
Nb205	7.47	132.90	0.321 Nb
Ti02	0.92	79.90	0.066 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	0.06	264.00	0.001 Th
U02	0.00	270.00	0.000 U+4
U03	10.19	286.00	0.203 U+6
U308	0.00	842.00	0.000 U+8
Y203	0.04	112.90	0.002 Y
La203	0.00	162.90	0.000 La
Ce203	0.14	164.10	0.005 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	0.004 Sb+3
Bi203	0.10	233.00	0.002 Bi+3
Mn0	0.23	70.94	0.018 Mn+2
Fe0	0.00	71.85	0.000 Fe+2
Ca0	10.20	56.08	1.037 Ca
Sr0	0.00	103.60	0.000 Sr
Ba0	0.00	153.30	0.000 Ba
Pb0	0.37	223.20	0.009 Pb+2
Na20	4.17	30.99	0.767 Na
K20	0.00	47.10	0.000 K
Cs20	0.00	140.90	0.000 Cs
F	1.46	19.00	0.438 F
H20+	0.00	9.01	0.000 OH
H20-	0.00	18.02	0.000 H2O
TOTAL	97.94		6.829 O
LESS O=F	0.61		
TOTAL	97.33		

A B O (O OH F) . 0.00 H2O
 2.05 2.0 6.00 0.83 0.00 0.44

(O + OH + F) = 1.27 Vacancies: -.05 A -.27 Y
 Dose (alphas/mg) = 0.419E+18 DPA (displacements/atom) = 55.3

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Ce ,Sb+3,Bi+3,Y ,Th ,K ,La
 Mean A valence = 2.03

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.97

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	60.30	220.90	1.558 Ta
Nb2O5	8.34	132.90	0.358 Nb
TiO2	1.17	79.90	0.084 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	0.10	264.00	0.002 Th
UO2	0.00	270.00	0.000 U+4
UO3	11.02	286.00	0.220 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.07	112.90	0.004 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.05	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	0.12	145.70	0.005 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.33	70.94	0.027 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	10.30	56.08	1.048 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.38	223.20	0.010 Pb+2
Na2O	3.36	30.99	0.619 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.09	19.00	0.327 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.63		6.868 O
LESS O=F	0.46		
TOTAL	96.17		

A B O (O OH F) . 0.00 H2O
 1.94 2.0 6.00 0.87 0.00 0.33

(O + OH + F) = 1.20 Vacancies: 0.06 A -.20 Y
 Dose (alphas/mg) = 0.459E+18 DPA (displacements/atom) = 61.1

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Sb+3,Y ,Th ,Ce ,K ,Sm ,La
 Mean A valence = 2.14

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.96

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	61.70	220.90	1.564 Ta
Nb2O5	8.33	132.90	0.351 Nb
TiO2	1.21	79.90	0.085 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	0.08	264.00	0.002 Th
UO2	0.00	270.00	0.000 U+4
UO3	11.02	286.00	0.216 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.07	112.90	0.003 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.09	164.10	0.003 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	0.07	233.00	0.002 Bi+3
MnO	0.07	70.94	0.006 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	8.75	56.08	0.874 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.28	223.20	0.007 Pb+2
Na2O	4.63	30.99	0.837 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.36	19.00	0.401 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.75		6.730 O
LESS O=F	0.57		
TOTAL	97.18		

A B O (O OH F) . 0.00 H2O
 1.95 2.0 6.00 0.73 0.00 0.40

(O + OH + F) = 1.13 Vacancies: 0.05 A -.13 Y
 Dose (alphas/mg) = 0.454E+18 DPA (displacements/atom) = 59.5

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Pb+2,Mn+2,Y ,Sb+3,Ce ,Th ,Bi+3,K ,Pr
 Mean A valence = 2.02

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.96

OXIDE	WT %	MOL WT	ATOMS
WO3	0.14	231.80	0.004 W
Ta2O5	58.10	220.90	1.536 Ta
Nb2O5	10.10	132.90	0.444 Nb
TiO2	0.22	79.90	0.016 Ti
ZrO2	0.00	123.20	0.000 Zr
SnO2	0.01	150.70	0.000 Sn
Fe2O3	0.00	159.70	0.000 Fe+3
ThO2	0.14	264.00	0.003 Th
UO2	0.00	270.00	0.000 U+4
UO3	9.07	286.00	0.185 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	0.34	164.10	0.012 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	0.05	145.70	0.002 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	1.14	70.94	0.094 Mn+2
FeO	0.06	71.85	0.005 Fe+2
CaO	12.60	56.08	1.312 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.22	223.20	0.006 Pb+2
Na2O	2.69	30.99	0.507 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.01	140.90	0.000 Cs
F	1.64	19.00	0.504 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.61		7.001 O
LESS O=F	0.69		
TOTAL	95.92		

A B O (O OH F) . 0.00 H2O
 2.13 2.0 6.00 1.00 0.00 0.50

(O + OH + F) = 1.51 Vacancies: -.13 A -.51 Y
 Dose (alphas/mg) = 0.379E+18 DPA (displacements/atom) = 49.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Pb+2,Fe+2,Y ,Th ,Sb+3,K ,Sm
 Mean A valence = 2.12

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.00	231.80	0.000 W
Ta2O5	63.20	220.90	1.688 Ta
Nb2O5	5.19	132.90	0.230 Nb
TiO2	1.10	79.90	0.081 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	0.04	264.00	0.001 Th
UO2	0.00	270.00	0.000 U+4
UO3	9.97	286.00	0.206 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.11	112.90	0.006 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.25	164.10	0.009 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	0.03	145.70	0.001 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.91	70.94	0.076 Mn+2
FeO	0.07	71.85	0.006 Fe+2
CaO	12.30	56.08	1.294 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.17	223.20	0.004 Pb+2
Na2O	2.57	30.99	0.489 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.46	19.00	0.453 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	97.37		7.000 O
LESS O=F	0.61		
TOTAL	96.75		

A B O (O OH F) . 0.00 H2O
 2.09 2.0 6.00 1.00 0.00 0.45

(O + OH + F) = 1.45 Vacancies: -.09 A -.45 Y
 Dose (alphas/mg) = 0.413E+18 DPA (displacements/atom) = 55.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Y ,Fe+2,Pb+2,Sb+3,Th ,K ,Nd
 Mean A valence = 2.17

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.96

OXIDE	WT %	MOL WT	ATOMS
WO3	0.13	231.80	0.003 W
Ta2O5	62.10	220.90	1.678 Ta
Nb2O5	5.98	132.90	0.269 Nb
TiO2	0.67	79.90	0.050 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	0.14	264.00	0.003 Th
UO2	0.00	270.00	0.000 U+4
UO3	9.37	286.00	0.196 U+6
U3O8	0.00	842.00	0.000 U+8
Y2O3	0.10	112.90	0.005 Y
La2O3	0.00	162.90	0.000 La
Ce2O3	0.22	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	0.08	145.70	0.003 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	1.10	70.94	0.093 Mn+2
FeO	0.08	71.85	0.007 Fe+2
CaO	12.00	56.08	1.277 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.27	223.20	0.007 Pb+2
Na2O	2.58	30.99	0.497 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.44	19.00	0.452 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	96.26		7.001 O
LESS O=F	0.60		
TOTAL	95.66		

A B O (O OH F) . 0.00 H2O
 2.10 2.0 6.00 1.00 0.00 0.45

(O + OH + F) = 1.45 Vacancies: -.10 A -.45 Y
 Dose (alphas/mg) = 0.393E+18 DPA (displacements/atom) = 52.9

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Pb+2,Fe+2,Y ,Sb+3,Th ,K ,Nd
 Mean A valence = 2.15

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.98

OXIDE	WT %	MOL WT	ATOMS
W03	0.27	231.80	0.007 W
Ta205	64.30	220.90	1.689 Ta
Nb205	5.36	132.90	0.234 Nb
Ti02	0.97	79.90	0.070 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	0.09	264.00	0.002 Th
U02	0.00	270.00	0.000 U+4
U03	9.83	286.00	0.199 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	0.23	164.10	0.008 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	0.03	145.70	0.001 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
MnO	0.45	70.94	0.037 Mn+2
FeO	0.05	71.85	0.004 Fe+2
CaO	11.80	56.08	1.221 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.37	223.20	0.010 Pb+2
Na2O	2.69	30.99	0.504 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.03	140.90	0.001 Cs
F	1.61	19.00	0.492 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	98.16		6.868 O
LESS O=F	0.68		
TOTAL	97.48		

A B O (O OH F) . 0.00 H2O
 1.99 2.0 6.00 0.87 0.00 0.49

(O + OH + F) = 1.36 Vacancies: 0.01 A -.36 Y
 Dose (alphas/mg) = 0.404E+18 DPA (displacements/atom) = 54.3

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Ce ,Y ,Fe+2,Th ,Sb+3,K ,Sm
 Mean A valence = 2.16

B = Ta ,Nb ,Ti ,W ,Sn ,Zr ,Fe+3
 Mean B valence = 4.97

OXIDE	WT %	MOL WT	ATOMS
W ₃	0.00	231.80	0.000 W
Ta ₂ O ₅	61.50	220.90	1.643 Ta
Nb ₂ O ₅	7.03	132.90	0.312 Nb
TiO ₂	0.60	79.90	0.044 Ti
ZrO ₂	0.00	123.20	0.000 Zr
SnO ₂	0.02	150.70	0.001 Sn
Fe ₂ O ₃	0.00	159.70	0.000 Fe+3
ThO ₂	0.13	264.00	0.003 Th
UO ₂	0.00	270.00	0.000 U+4
UO ₃	9.67	286.00	0.200 U+6
U ₃ O ₈	0.00	842.00	0.000 U+8
Y ₂ O ₃	0.09	112.90	0.005 Y
La ₂ O ₃	0.00	162.90	0.000 La
Ce ₂ O ₃	0.31	164.10	0.011 Ce
Pr ₂ O ₃	0.00	164.90	0.000 Pr
Nd ₂ O ₃	0.00	168.20	0.000 Nd
Sm ₂ O ₃	0.00	174.40	0.000 Sm
Sb ₂ O ₃	0.13	145.70	0.005 Sb+3
Bi ₂ O ₃	0.01	233.00	0.000 Bi+3
MnO	0.64	70.94	0.053 Mn+2
FeO	0.07	71.85	0.006 Fe+2
CaO	11.40	56.08	1.199 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.26	223.20	0.007 Pb+2
Na ₂ O	2.64	30.99	0.503 Na
K ₂ O	0.00	47.10	0.000 K
Cs ₂ O	0.00	140.90	0.000 Cs
F	1.37	19.00	0.425 F
H ₂ O+	0.00	9.01	0.000 OH
H ₂ O-	0.00	18.02	0.000 H ₂ O
TOTAL	95.87		6.918 O
LESS O=F	0.58		
TOTAL	95.30		

A B O (O OH F) . 0.00 H₂O
 1.99 2.0 6.00 0.92 0.00 0.43

(O + OH + F) = 1.34 Vacancies: 0.01 A -.34 Y
 Dose (alphas/mg) = 0.407E+18 DPA (displacements/atom) = 54.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Ce ,Pb+2,Fe+2,Sb+3,Y ,Th ,Bi+3,K
 Mean A valence = 2.16

B = Ta ,Nb ,Ti ,Sn ,W ,Zr ,Fe+3
 Mean B valence = 4.98

OXIDE	WT %	MOL WT	ATOMS
WO3	0.32	231.80	0.007 W
Ta2O5	73.50	220.90	1.759 Ta
Nb2O5	5.63	132.90	0.224 Nb
TiO2	0.14	79.90	0.009 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	2.15	286.00	0.040 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	0.13	145.70	0.005 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.22	70.94	0.016 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.20	56.08	1.056 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.33	223.20	0.008 Pb+2
Na2O	4.59	30.99	0.783 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	2.36	19.00	0.657 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	100.57		6.269 O
LESS O=F	0.99		
TOTAL	99.58		

A B O (O OH F) . 0.00 H2O
 1.91 2.0 6.00 0.27 0.00 0.66

(O + OH + F) = 0.93 Vacancies: 0.09 A 0.07 Y
 Dose (alphas/mg) = 0.865E+17 DPA (displacements/atom) = 10.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Sb+3,K ,Ce ,Pr ,Nd ,Sm ,La
 Mean A valence = 1.68

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

OXIDE	WT %	MOL WT	ATOMS
W03	0.08	231.80	0.002 W
Ta205	72.90	220.90	1.758 Ta
Nb205	5.48	132.90	0.220 Nb
Ti02	0.30	79.90	0.020 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	2.50	286.00	0.047 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	0.22	145.70	0.008 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
MnO	0.12	70.94	0.009 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.50	56.08	1.093 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.42	223.20	0.010 Pb+2
Na2O	4.30	30.99	0.739 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	2.10	19.00	0.589 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.92		6.330 O
LESS O=F	0.88		
TOTAL	99.04		

A B O (O OH F) . 0.00 H2O
 1.91 2.0 6.00 0.33 0.00 0.59

(O + OH + F) = 0.92 Vacancies: 0.09 A 0.08 Y
 Dose (alphas/mg) = 0.101E+18 DPA (displacements/atom) = 12.7

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Pb+2,Mn+2,Sb+3,K ,Ce ,Pr ,Nd ,Sm ,La
 Mean A valence = 1.71

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

OXIDE	WT %	MOL WT	ATOMS
W03	0.16	231.80	0.004 W
Ta205	73.00	220.90	1.760 Ta
Nb205	5.51	132.90	0.221 Nb
Ti02	0.24	79.90	0.016 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	2.34	286.00	0.044 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	0.19	145.70	0.007 Sb+3
Bi203	0.00	233.00	0.000 Bi+3
MnO	0.12	70.94	0.009 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	11.10	56.08	1.054 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.32	223.20	0.008 Pb+2
Na2O	4.31	30.99	0.741 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.88	19.00	0.527 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.17		6.312 O
LESS O=F	0.79		
TOTAL	98.38		

A B O (O OH F) . 0.00 H2O
 1.86 2.0 6.00 0.31 0.00 0.53

(O + OH + F) = 0.84 Vacancies: 0.14 A 0.16 Y
 Dose (alphas/mg) = 0.953E+17 DPA (displacements/atom) = 12.0

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Mn+2,Pb+2,Sb+3,K ,Ce ,Pr ,Nd ,Sm ,La
 Mean A valence = 1.70

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

OXIDE	WT %	MOL WT	ATOMS
WO3	0.31	231.80	0.007 W
Ta2O5	73.70	220.90	1.761 Ta
Nb2O5	5.62	132.90	0.223 Nb
TiO2	0.13	79.90	0.009 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	1.94	286.00	0.036 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	0.17	145.70	0.006 Sb+3
Bi2O3	0.00	233.00	0.000 Bi+3
MnO	0.08	70.94	0.006 Mn+2
FeO	0.00	71.85	0.000 Fe+2
CaO	10.90	56.08	1.026 Ca
SrO	0.00	103.60	0.000 Sr
BaO	0.00	153.30	0.000 Ba
PbO	0.42	223.20	0.010 Pb+2
Na2O	4.24	30.99	0.722 Na
K2O	0.00	47.10	0.000 K
Cs2O	0.00	140.90	0.000 Cs
F	1.73	19.00	0.481 F
H2O+	0.00	9.01	0.000 OH
H2O-	0.00	18.02	0.000 H2O
TOTAL	99.24		6.278 O
LESS O=F	0.73		
TOTAL	98.51		

A B O (O OH F) . 0.00 H2O
 1.81 2.0 6.00 0.28 0.00 0.48

(O + OH + F) = 0.76 Vacancies: 0.19 A 0.24 Y
 Dose (alphas/mg) = 0.788E+17 DPA (displacements/atom) = 9.9

microlite Age = 0.130E+10 years

Cation abundances (decreasing order):

A = Ca ,Na ,U+6 ,Pb+2,Sb+3,Mn+2,K ,Ce ,Pr ,Nd ,Sm ,Y
 Mean A valence = 1.68

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