SDMS # 2146411

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5519

SFUND RECORDS CTR
2146411

Response of RJ Lee Group to EPA Region 9 (Meer) Letter dated March 9, 2006

Regarding Evaluation of EPA's Analytical Data from the El Dorado Hills Asbestos Evaluation Project

Exhibit C *1.2.4j*

RJLG re-measurement of Lab/Cor SAED patterns showing Lab/Cor measurement errors

Date: July 2006

Prepared by:
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Monroeville, PA 15146
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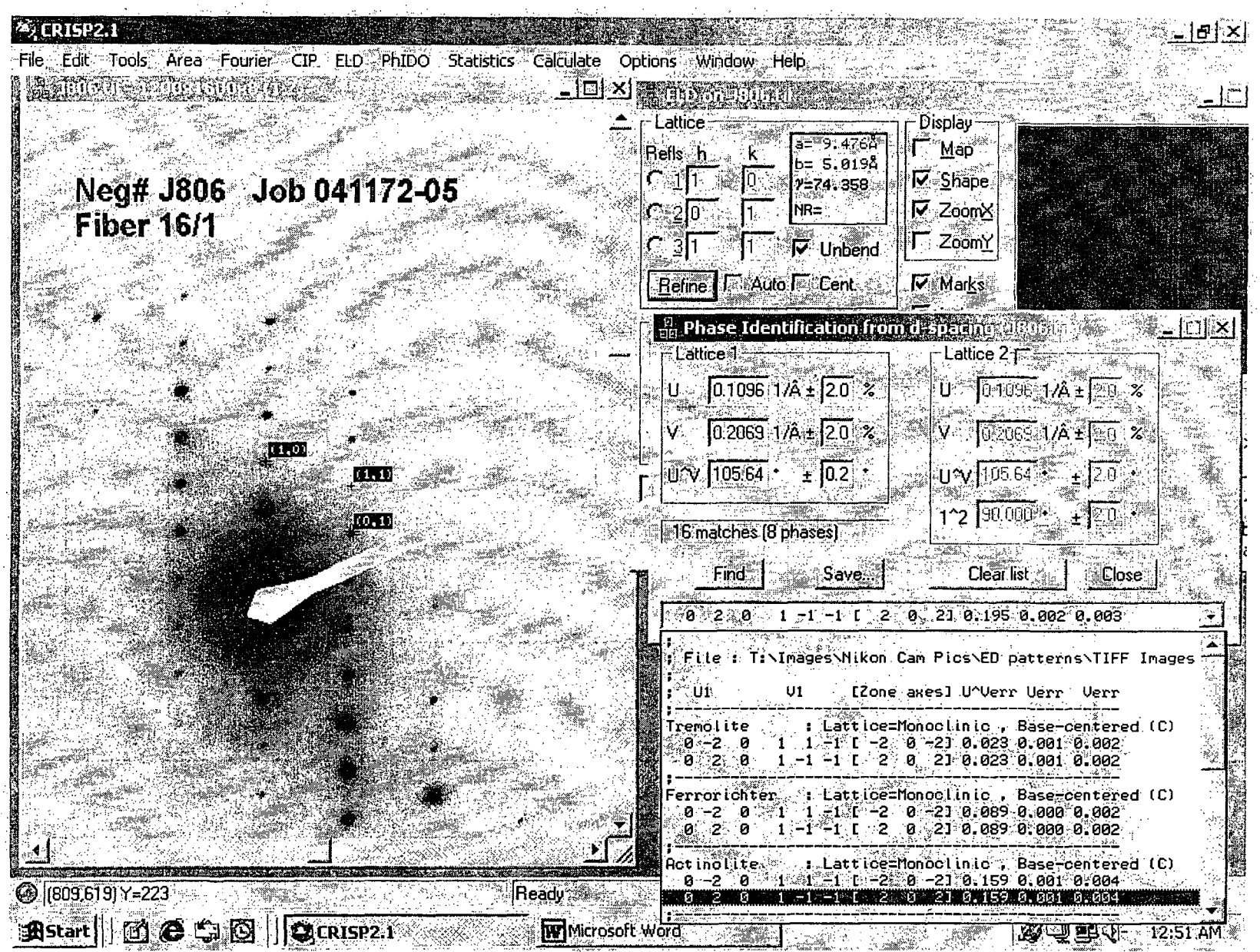
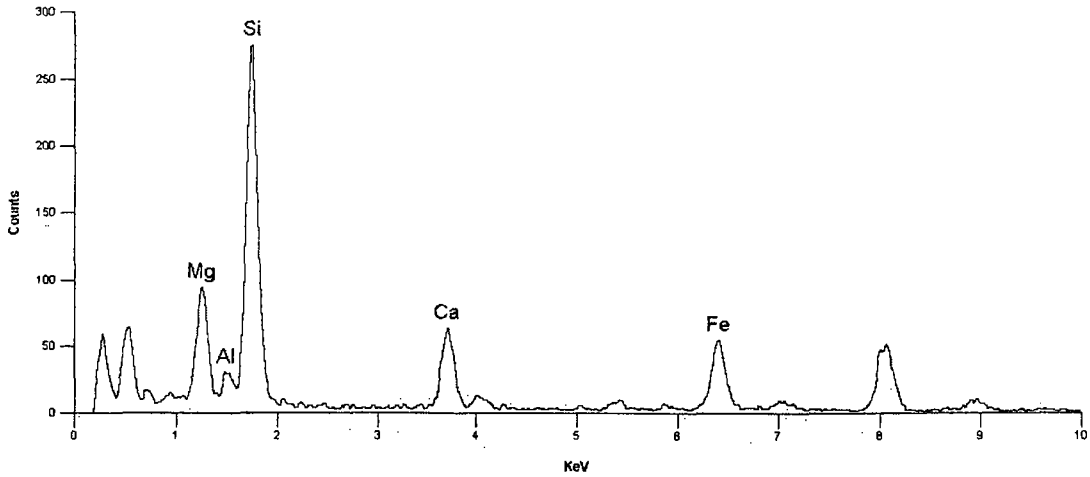
ACTINOLITE
[101]





Quantitative Analysis Results - Standardless Analysis :
Spectrum1 041172-05 16/1 SP 549 Jan 1, 1997
EDS Parameters - 18KV, Takeoff Angle: 28.2°, Fit Index: 368.94
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	10.35	MgO	19.21	1.66	19.21
Al	0.88	Al2O3	2.07	0.49	2.07
Si	20.40	SiO2	56.44	2.54	56.44
Ca	3.15	CaO	8.14	0.92	8.14
Fe	3.84	Fe2O3	14.14	1.77	14.14
<Total>	100.00		100.00		100.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	56.44	Si+4	7.7385	7.7385							
Al2O3	2.07	Al+3	0.3345	0.2615	**0.0730**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	14.14	Fe+3	0.7148			0.7148	0.0000				
MgO	19.21	Mg+2	3.9266			3.9266	**0.0000**				
MnO	0	Fe+2	0.8268			0.2856	**0.5412**				
CaO	8.14	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0	Ca+2	1.1957					1.1957	0.0000		
K2O	0	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	**100**		**Excess**	T site	**0.0730**	C site	**0.5412**	B site	**0**	A site	**0**
			Total	**8**		**5.0000**		**1.1957**		**0.0000**	**0.0000**
			%Fill	**100**		**100**		**59.784**			

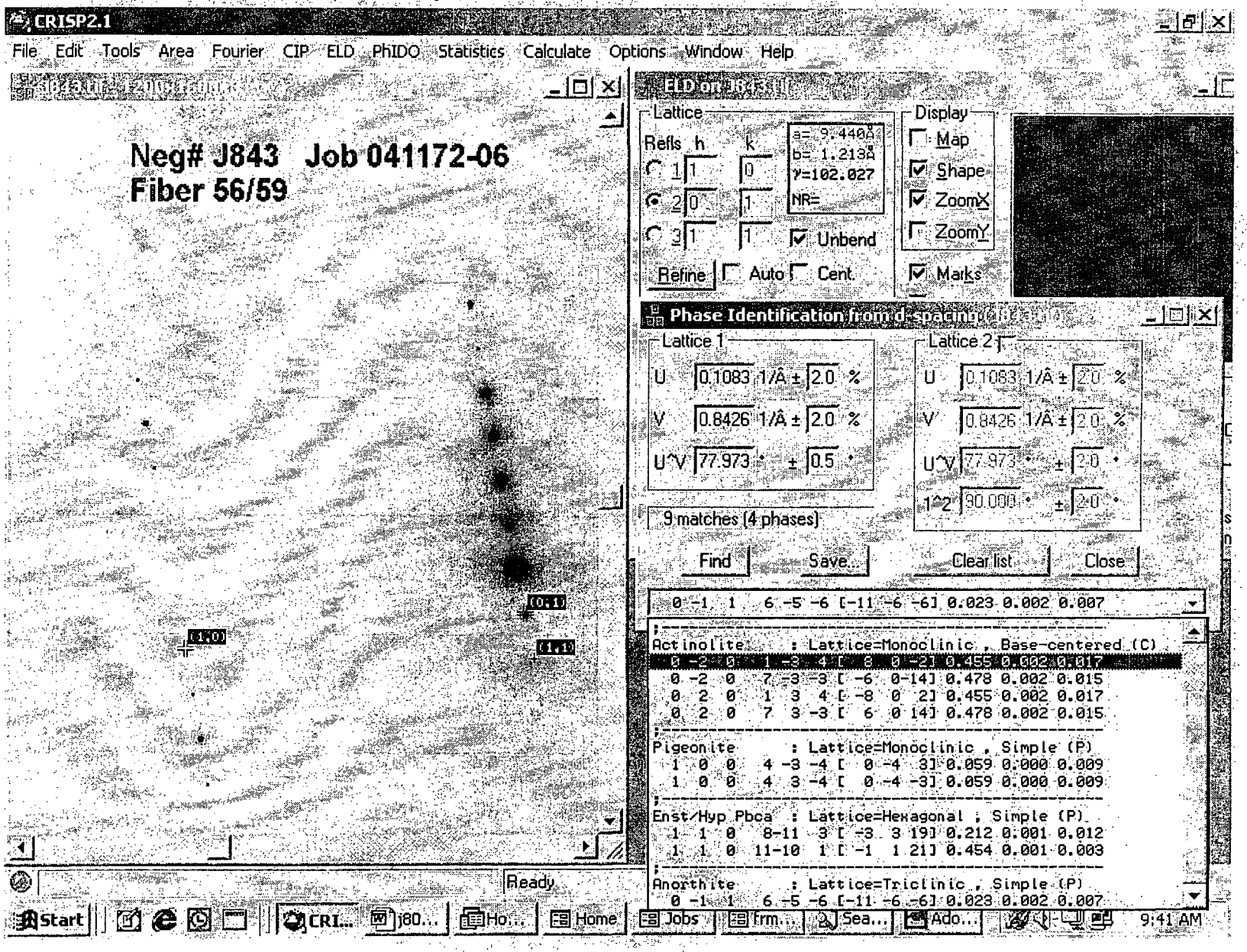
Prefix none
Name probable actinolite Ca values below optimal levels
Modifier none
Group Calcic Amphibole

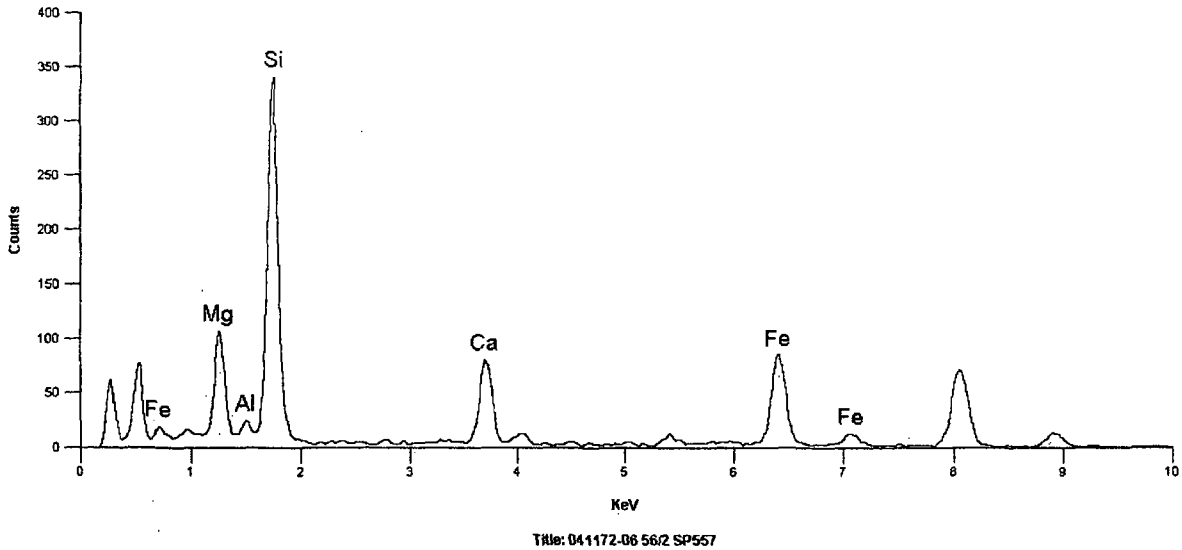
Sample # **041172-05-549**

Values		Satisfied Conditions
(Ca,Na)@B	1.20	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	1 < Ca@B < 1.5 and (Na,K)@A < 0.5
Ca@B	1.20	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.83	(Mg/(Mg+Fe2))< 0.9
Si	7.74	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[4 0 -1]





Quantitative Analysis Results - Standardless Analysis :
Spectrum1 041172-06 56/2 SP557 Jan 1, 1997
EDS Parameters - 18KV, Takeoff Angle: 28.2°, Fit Index: 588.52
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	9.11	MgO	16.52	1.14	16.52
Al	0.46	Al2O3	1.06	0.30	1.06
Si	19.97	SiO2	53.96	1.86	53.96
Ca	3.61	CaO	9.09	0.70	9.09
Fe	5.40	Fe2O3	19.37	1.54	19.37
<Total>	100.00		100.00		100.00

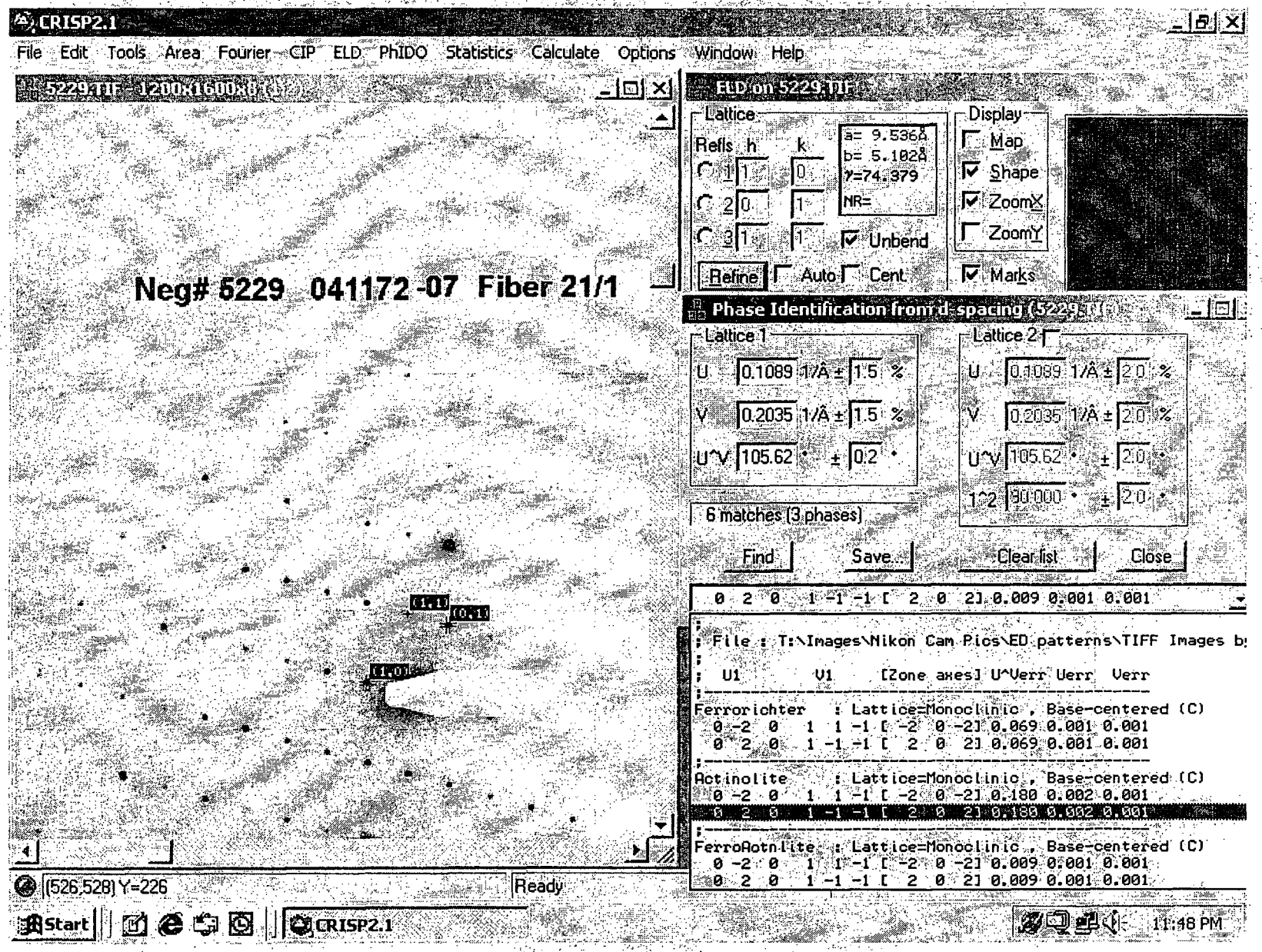
	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	53.96	Si+4	7.6078	7.6078							
Al2O3	1.06	Al+3	0.1761	0.1761	**0.0000**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	19.37	Fe+3	1.0069			1.0069	0.0000				
MgO	16.52	Mg+2	3.4723			3.4723	**0.0000**				
MnO	0	Fe+2	1.1646			0.5208	**0.6439**				
CaO	9.09	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0	Ca+2	1.3730					1.3561	0.0169		
K2O	0	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	**100**		**Excess**	T site	**0.0000**	C site	**0.6439**	B site	**0.016856**	A site	**0**
			Total	**7.7839**		**5.0000**		**1.3561**		**0.0000**	**0.0000**
			%Fill	**97.298**		**100**		**67.8071**			

Prefix Ferri
Name probable actinolite Ca values below optimal levels
Modifier none
Group Calcic Amphibole

Sample # **041172-06-557**

Values		Satisfied Conditions
(Ca,Na)@B	1.36	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	1 < Ca@B < 1.5 and (Na,K)@A < 0.5
Ca@B	1.36	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.75	(Mg/(Mg+Fe2))< 0.9
Si	7.61	

Mineral Analysis Program (Version 5.0)


CRISP2.1
File Edit Tools Area Fourier CIP ELD PhIDO Statistics Calculate Options Window Help
5229.TIF 1200x1600x8 (1/2)
Neg# 5229 041172 -07 Fiber 21/1
(1,1)
(0,1)
(1,0)
(526,528) Y=226
Ready
Start
CRISP2.1
11:48 PM
ELD on 5229.TIF
Lattice
Refls h k
1 1 0
2 0 1
3 1 1
a= 9.536Å
b= 5.102Å
γ=74.379
NR=
Unbend
Refine
Auto
Cent
Display
Map
Shape
ZoomX
ZoomY
Marks
Phase Identification from d-spacing (5229.tif)
Lattice 1
U 0.1089 1/Å ± 1.5 %
V 0.2035 1/Å ± 1.5 %
U^V 105.62 ° ± 0.2 °
Lattice 2
U 0.1089 1/Å ± 2.0 %
V 0.2035 1/Å ± 2.0 %
U^V 105.62 ° ± 2.0 °
1^2 90.000 ° ± 2.0 °
6 matches (3 phases)
Find
Save...
Clear list
Close
0 2 0 1 -1 -1 [2 0 2] 0.009 0.001 0.001
; File : T:\Images\Nikon Cam Pics\ED patterns\TIFF Images b
; U1 V1 [Zone axes] U^Verr Verr Verr
Ferrorichter : Lattice=Monoclinic , Base-centered (C)
0 -2 0 1 1 -1 [-2 0 -2] 0.069 0.001 0.001
0 2 0 1 -1 -1 [2 0 2] 0.069 0.001 0.001
Actinolite : Lattice=Monoclinic , Base-centered (C)
0 -2 0 1 1 -1 [-2 0 -2] 0.180 0.002 0.001
0 2 0 1 -1 -1 [2 0 2] 0.180 0.002 0.001
FerroAotnlite : Lattice=Monoclinic , Base-centered (C)
0 -2 0 1 1 -1 [-2 0 -2] 0.009 0.001 0.001
0 2 0 1 -1 -1 [2 0 2] 0.009 0.001 0.001

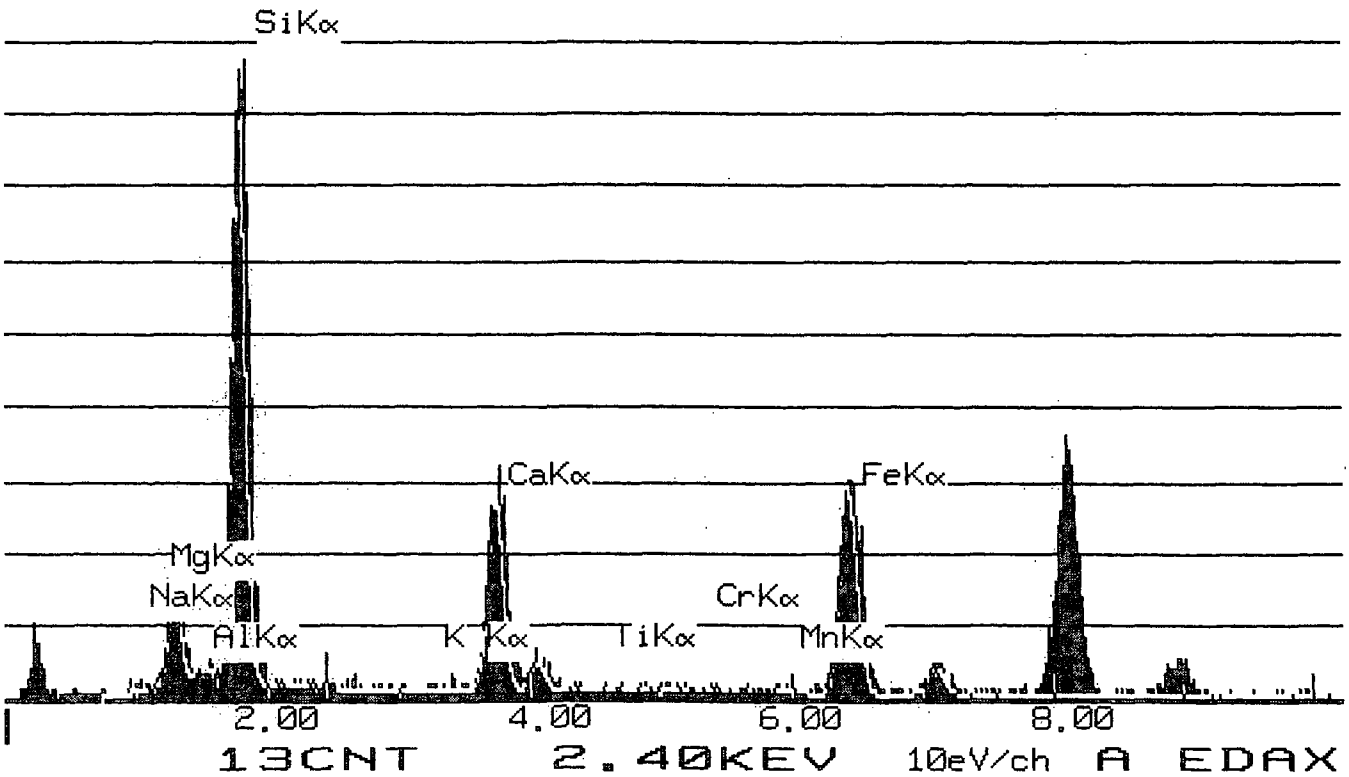
INTE-% :
LABEL = 041172-07 21/21 15149
23-NOV-72 00:17:00
55.752 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
NAK	0.215	0.256	0.345
MGK	12.879	7.240	12.004
ALK	1.058	0.357	0.675
SIK	78.312	24.759	52.968
CAK	30.887	9.310	13.027
CRK	0.413	0.173	0.253
MNK	0.574	0.250	0.322
FEK	35.640	14.272	20.405

TOTAL			100.000

USED PEIF: USER

22-NOV-04 00:17:30 SUPER QUANT
RATE= 1CPS TIME= 55LSEC
FS= 509/ 509 PRST= 200LSEC
A =041172-07 21/21 15149



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	52.968	Si+4	7.7415	7.7415							
Al2O3	0.675	Al+3	0.1163	0.1163	**0.0000**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0.253	Cr+3	0.0292			0.0292	0.0000				
Fe(total)O	20.405	Fe+3	0.1571			0.1571	0.0000				
MgO	12.004	Mg+2	2.6155			2.6155	**0.0000**				
MnO	0.322	Fe+2	2.3192			2.1981	**0.1210**				
CaO	13.027	Mn+2	0.0399			0.0000	**0.0399**				
Na2O	0.345	Ca+2	2.0397					1.8391	0.2006		
K2O	0	Na+	0.0978					0.0000	**0.0978**	0.0978	0.0000
		K+	0.0000							0.0000	0.0000
Total	**99.999**		**Excess**	T site	**0.0000**	C site	**0.1609**	B site	**0.2983809**	A site	**0**
			Total	**7.8577**		**5.0000**		**1.8391**		**0.0978**	**0.0000**
			%Fill	**98.222**		**100**		**91.956**			

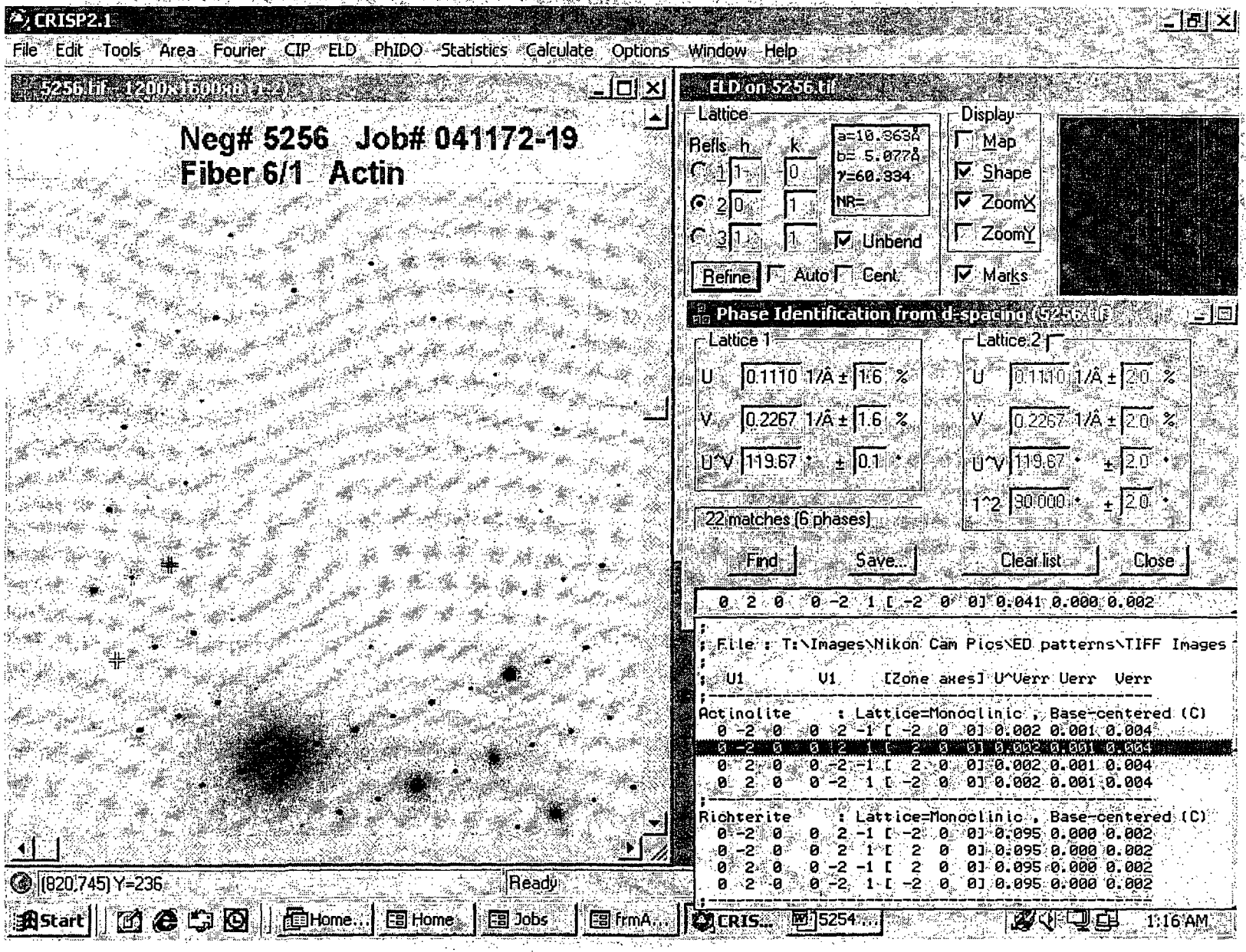
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # **041172-07-21**

Values		Satisfied Conditions
(Ca,Na)@B	1.84	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.84	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.10	Si > 7.5
Mg/(Mg+Fe2)	0.53	(Mg/(Mg+Fe2))< 0.9
Si	7.74	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[100]

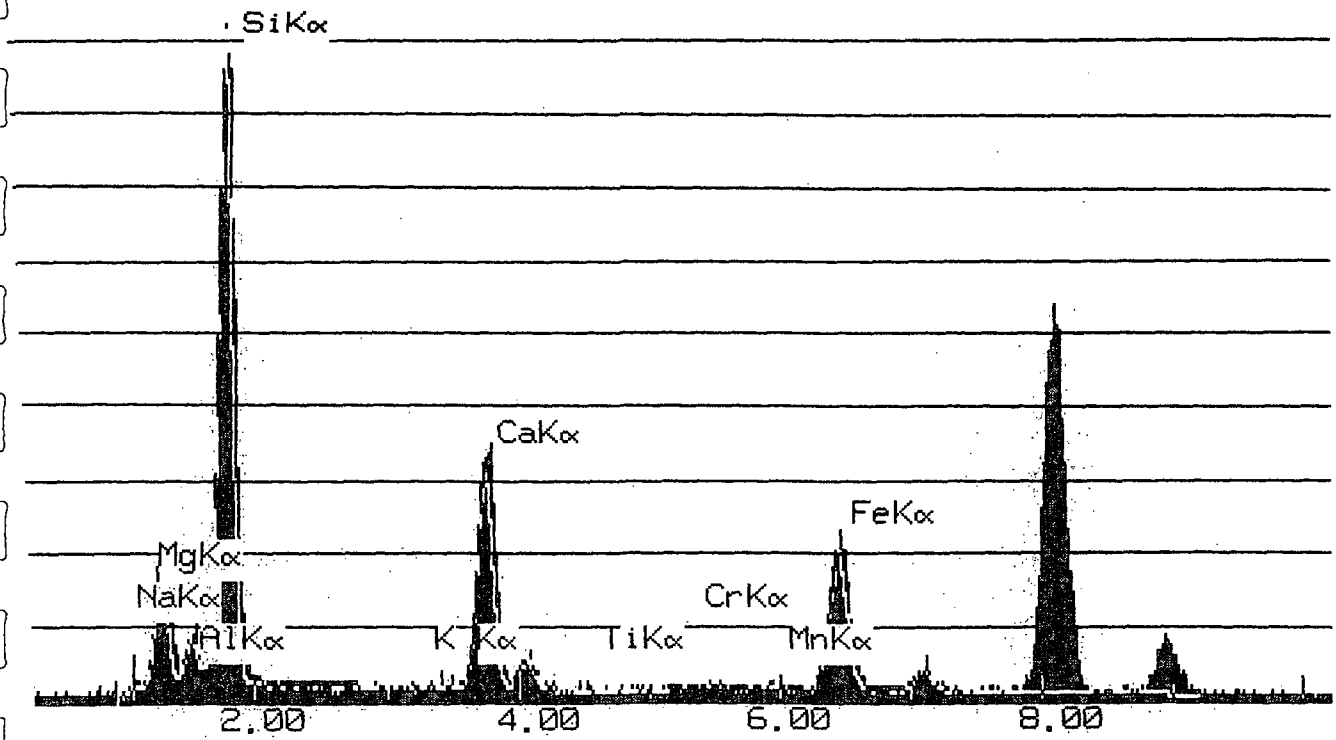


INTE-% :
LABEL = 041172-19 6/1 15175
11-OCT-72 18:05:04
45.048 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	30.812	9.427	15.630
ALK	10.012	1.840	3.476
SIK	147.532	25.386	54.309
CAK	59.381	9.742	13.631
MNK	0.355	0.084	0.109
FEK	41.223	8.984	12.845
TOTAL			100.000

USED PEIF: USER

10-OCT-04 18:06:06 SUPER QUANT
RATE= 521CPS TIME= 45LSEC
FS= 725/ 725 PRST= 200LSEC
A =041172-19 6/1 15175



10CNT 1.04KEV 10eV/ch A EDAX

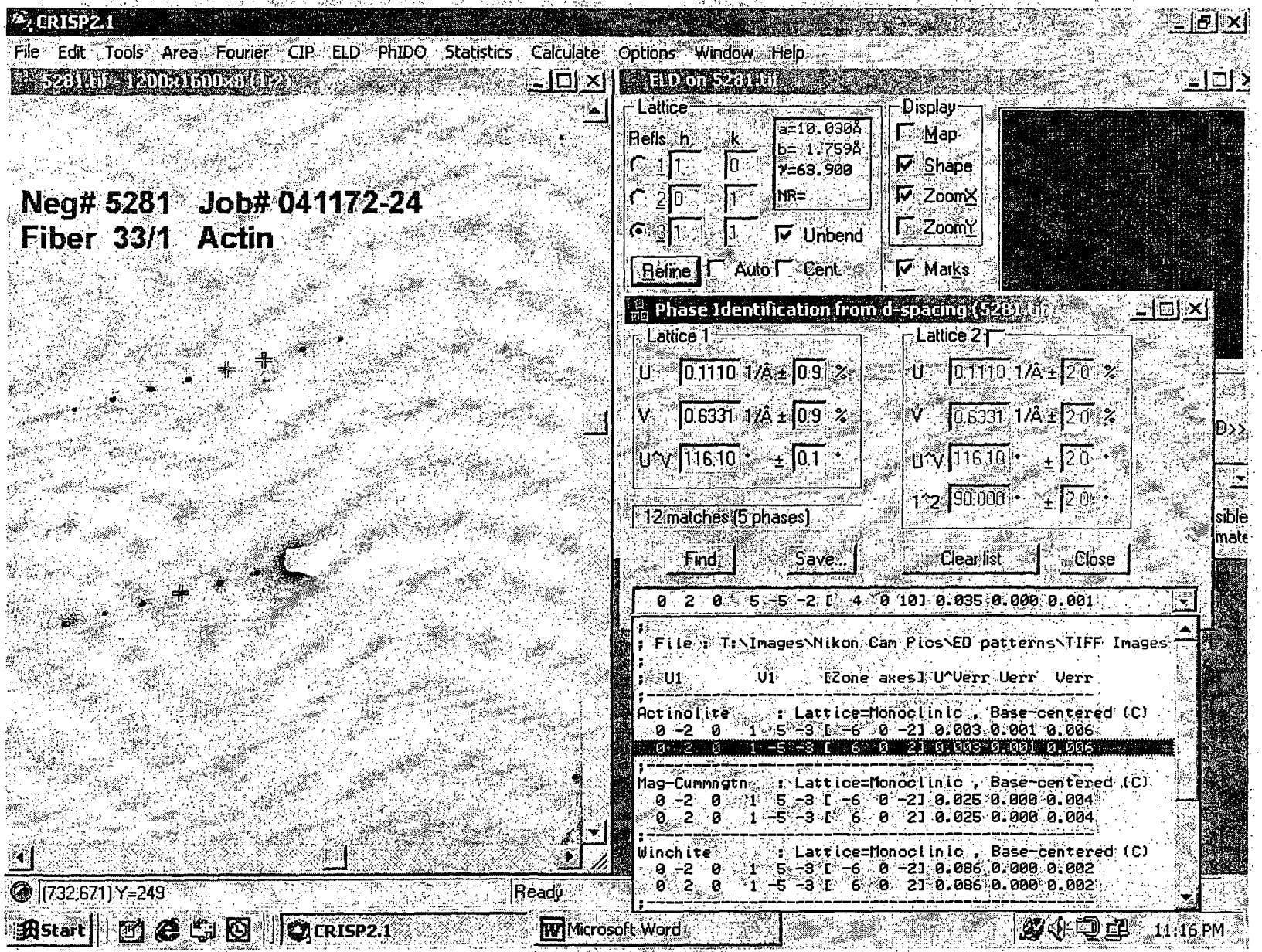
	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.309	Si+4	7.6345	7.6345							
Al2O3	3.476	Al+3	0.5759	0.3655	**0.2104**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.845	Fe+3	0.0408			0.0408	0.0000				
MgO	15.63	Mg+2	3.2756			3.2756	**0.0000**				
MnO	0.109	Fe+2	1.4646			1.4646	**0.0000**				
CaO	13.631	Mn+2	0.0130			0.0087	**0.0043**				
Na2O	0	Ca+2	2.0529					1.9957	0.0572		
K2O	0	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	**100**		**Excess**	T site	**0.2104**	C site	**0.0043**	B site	**0.0571804**	A site	**0**
			Total	**8**		**5.0000**		**1.9957**		**0.0000**	**0.0000**
			%Fill	**100**		**100**		**99.7839**			

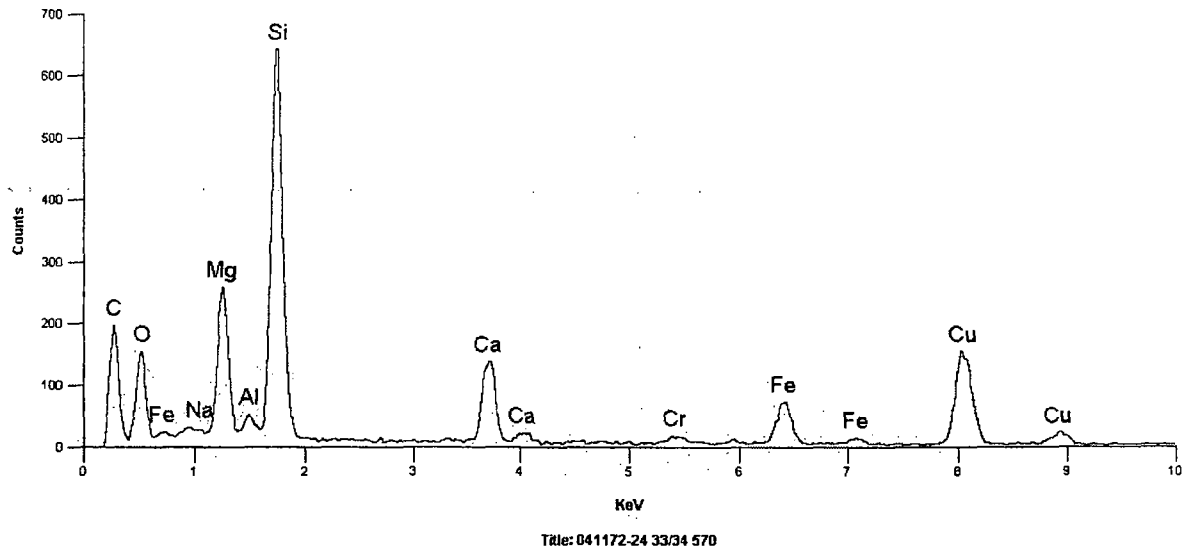
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # **041172-19-15175**

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.69	(Mg/(Mg+Fe2))< 0.9
Si	7.63	

Mineral Analysis Program (Version 5.0)


CRISP2.1
File Edit Tools Area Fourier CIP ELD PhIDO Statistics Calculate Options Window Help
5281.tif 1200x1600x8 (1:2)
Neg# 5281 Job# 041172-24
Fiber 33/1 Actin
ELD on 5281.tif
Lattice
Refls h k
a=10.030Å
b= 1.759Å
γ=63.900
NR=
Unbend
Refine
Auto
Cent
Display
Map
Shape
ZoomX
ZoomY
Marks
Phase Identification from d-spacing (5281.tif)
Lattice 1
U 0.1110 1/Å ± 0.9 %
V 0.6331 1/Å ± 0.9 %
U^V 116.10 ° ± 0.1 °
Lattice 2
U 0.1110 1/Å ± 2.0 %
V 0.6331 1/Å ± 2.0 %
U^V 116.10 ° ± 2.0 °
1^2 90.000 ° ± 2.0 °
12 matches (5 phases)
Find
Save...
Clear list
Close
0 2 0 5 -5 -2 [4 0 10] 0.035 0.000 0.001
; File : T:\Images\Nikon Cam Pics\ED patterns\TIFF Images
; U1 V1 [Zone axes] U^Verr Uerr Verr
Actinolite : Lattice=Monoclinic , Base-centered (C)
0 -2 0 1 5 -3 [-6 0 -2] 0.003 0.001 0.006
0 2 0 1 -5 -3 [6 0 2] 0.003 0.001 0.006
Mag-Cummngtn : Lattice=Monoclinic , Base-centered (C)
0 -2 0 1 5 -3 [-6 0 -2] 0.025 0.000 0.004
0 2 0 1 -5 -3 [6 0 2] 0.025 0.000 0.004
Winchite : Lattice=Monoclinic , Base-centered (C)
0 -2 0 1 5 -3 [-6 0 -2] 0.086 0.000 0.002
0 2 0 1 -5 -3 [6 0 2] 0.086 0.000 0.002
(732,671) Y=249
Ready
Start
CRISP2.1
Microsoft Word
11:16 PM



Quantitative Analysis Results - Standardless Analysis :
Spectrum7 041172-24 33/34 570 Jan 1, 1997
EDS Parameters - 18KV, Takeoff Angle: 28.2°, Fit Index: 173.23
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	32.38	MgO	44.32	0.17	24.05
Al	1.43	Al2O3	2.48	0.04	1.35
Si	51.77	SiO2	105.62	0.25	57.31
K	0.23	K2O	0.37	0.03	0.20
Ca	8.63	CaO	16.44	0.09	8.92
Fe	5.55	Fe2O3	15.05	0.14	8.17
<Total>	100.00		184.28		100.00

See following page for correct quants

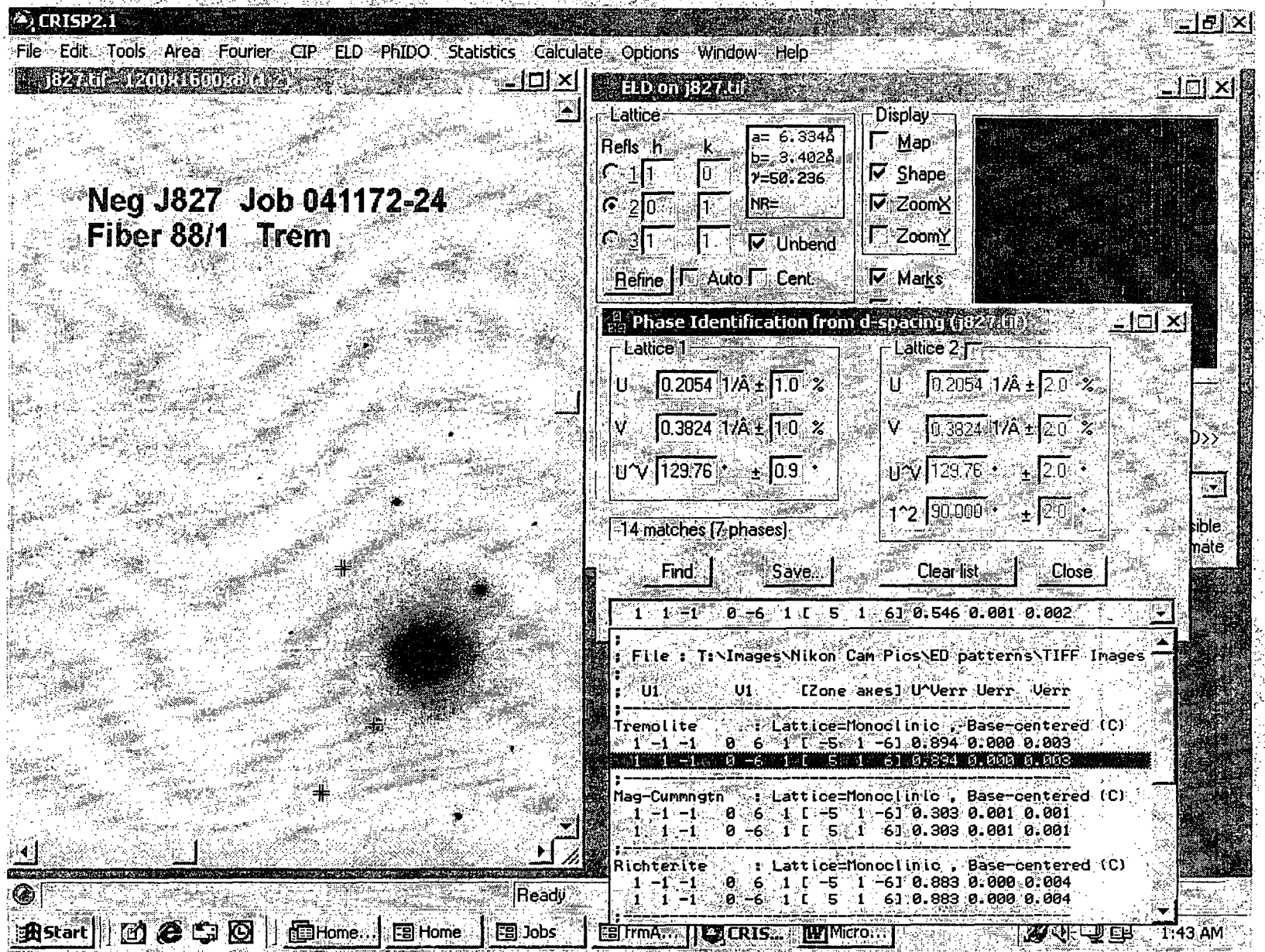
	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	61.25	Si+4	8.0000	8.0000							
Al2O3	4.04	Al+3	0.6520	0.0000	**0.6520**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	6.42	Fe+3	0.0172			0.0172	0.0000				
MgO	17.09	Mg+2	3.4415			3.4415	**0.0000**				
MnO	0	Fe+2	0.7329			0.7329	**0.0000**				
CaO	10.98	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0	Ca+2	1.5999					1.5999	0.0000		
K2O	0.21	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0539							0.0539	0.0000
Total	**99.99**		**Excess**	T site	**0.6520**	C site	**0.0000**	B site	**0**	A site	**0**
			Total	**8**		**4.8436**		**1.5999**		**0.0539**	**0.0000**
			%Fill	**100**		**96.8711**		**79.9933**			

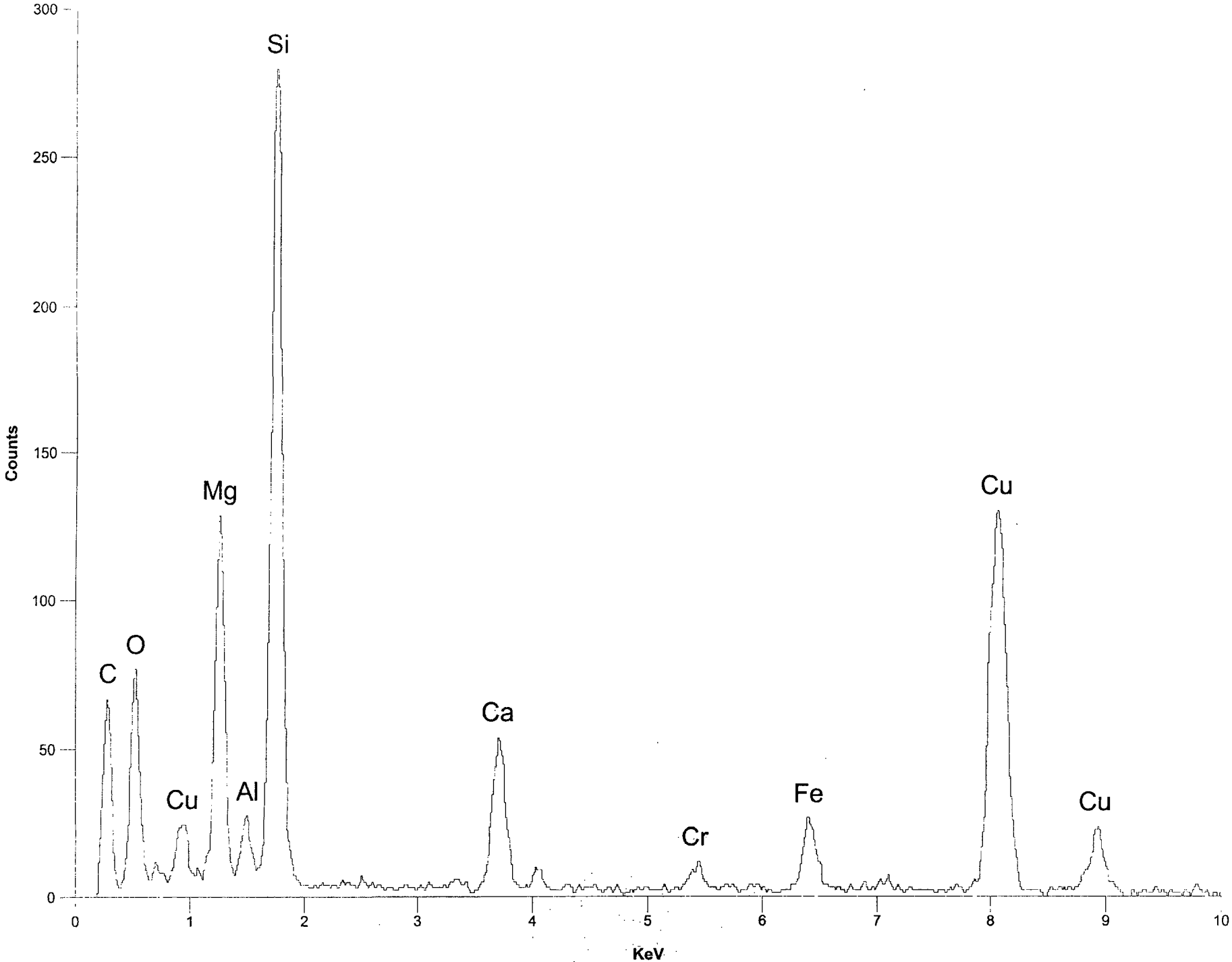
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # **041172-24-33**

Values		Satisfied Conditions
(Ca,Na)@B	1.60	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.60	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.05	Si > 7.5
Mg/(Mg+Fe2)	0.82	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)


CRISP2.1
File Edit Tools Area Fourier CIP ELD PhIDO Statistics Calculate Options Window Help
Neg J827 Job 041172-24
Fiber 88/1 Trem
ELD on j827.tif
Lattice
Refls h k
a= 6.334Å
b= 3.402Å
γ=50.236
NR=
Unbend
Refine
Auto
Cent
Display
Map
Shape
ZoomX
ZoomY
Marks
Phase Identification from d-spacing (j827.tif)
Lattice 1
U 0.2054 1/Å ± 1.0 %
V 0.3824 1/Å ± 1.0 %
U^V 129.76 ° ± 0.9 °
Lattice 2
U 0.2054 1/Å ± 2.0 %
V 0.3824 1/Å ± 2.0 %
U^V 129.76 ° ± 2.0 °
1^2 90.000 ° ± 2.0 °
14 matches (7 phases)
Find
Save...
Clear list
Close
1 1 -1 0 -6 1 [5 1 6] 0.546 0.001 0.002
; File : T:\Images\Nikon Cam Pics\ED patterns\TIFF Images
; U1 V1 [Zone axes] U^Verr Uerr Verr
Tremolite : Lattice=Monoclinic , Base-centered (C)
1 -1 -1 0 6 1 [-5 1 -6] 0.894 0.000 0.003
1 1 -1 0 -6 1 [5 1 6] 0.894 0.000 0.003
Mag-Cummngtn : Lattice=Monoclinic , Base-centered (C)
1 -1 -1 0 6 1 [-5 1 -6] 0.303 0.001 0.001
1 1 -1 0 -6 1 [5 1 6] 0.303 0.001 0.001
Richterite : Lattice=Monoclinic , Base-centered (C)
1 -1 -1 0 6 1 [-5 1 -6] 0.883 0.000 0.004
1 1 -1 0 -6 1 [5 1 6] 0.883 0.000 0.004
Ready
Start
Home...
Home
Jobs
1:43 AM



041172-24 88/97 SP573

Title: 041172-24 88/97 SP573

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.98	Si+4	7.6053	7.6053							
Al2O3	3.53	Al+3	0.5755	0.3947	**0.1808**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.45	Fe+3	0.5443			0.5443	0.0000				
MgO	16.76	Mg+2	3.4563			3.4563	**0.0000**				
MnO	0	Fe+2	0.8352			0.8186	**0.0166**				
CaO	12.26	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0.01	Ca+2	1.8169					1.8169	0.0000		
K2O	0	Na+	0.0027					0.0027	**0.0000**	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	**99.99**		**Excess**	T site	**0.1808**	C site	**0.0166**	B site	**0**	A site	**0**
			Total	**8**		**5.0000**		**1.8196**		**0.0000**	**0.0000**
			%Fill	**100**		**100**		**90.9779**			

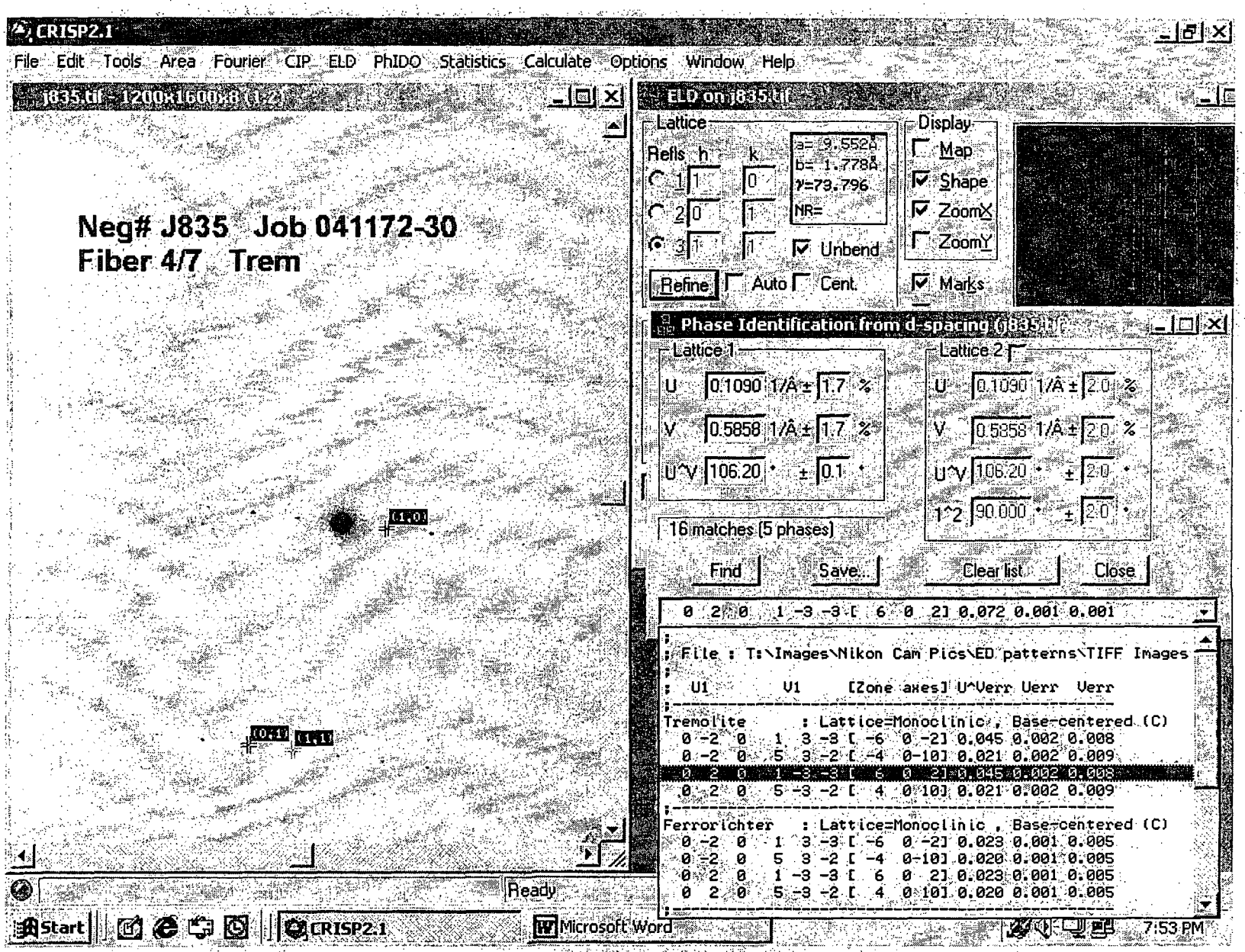
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

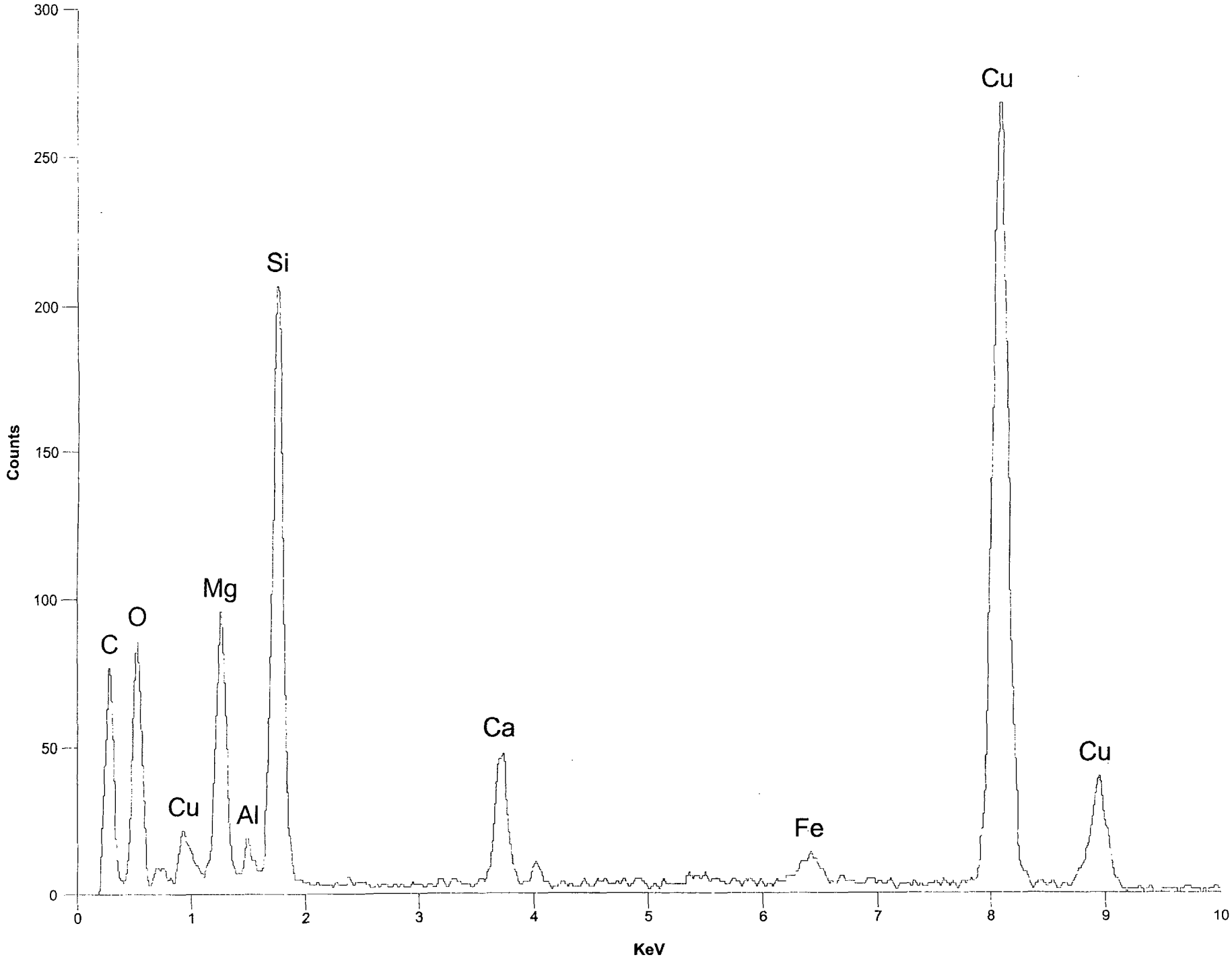
Sample # **041172-24-89-98**

Values		Satisfied Conditions
(Ca,Na)@B	1.82	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.82	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.81	(Mg/(Mg+Fe2))< 0.9
Si	7.61	

Mineral Analysis Program (Version 5.0)

TREMOLITE
[301]





Title: 041172-30 4/7 580

Title: 041172-30 4/7 580

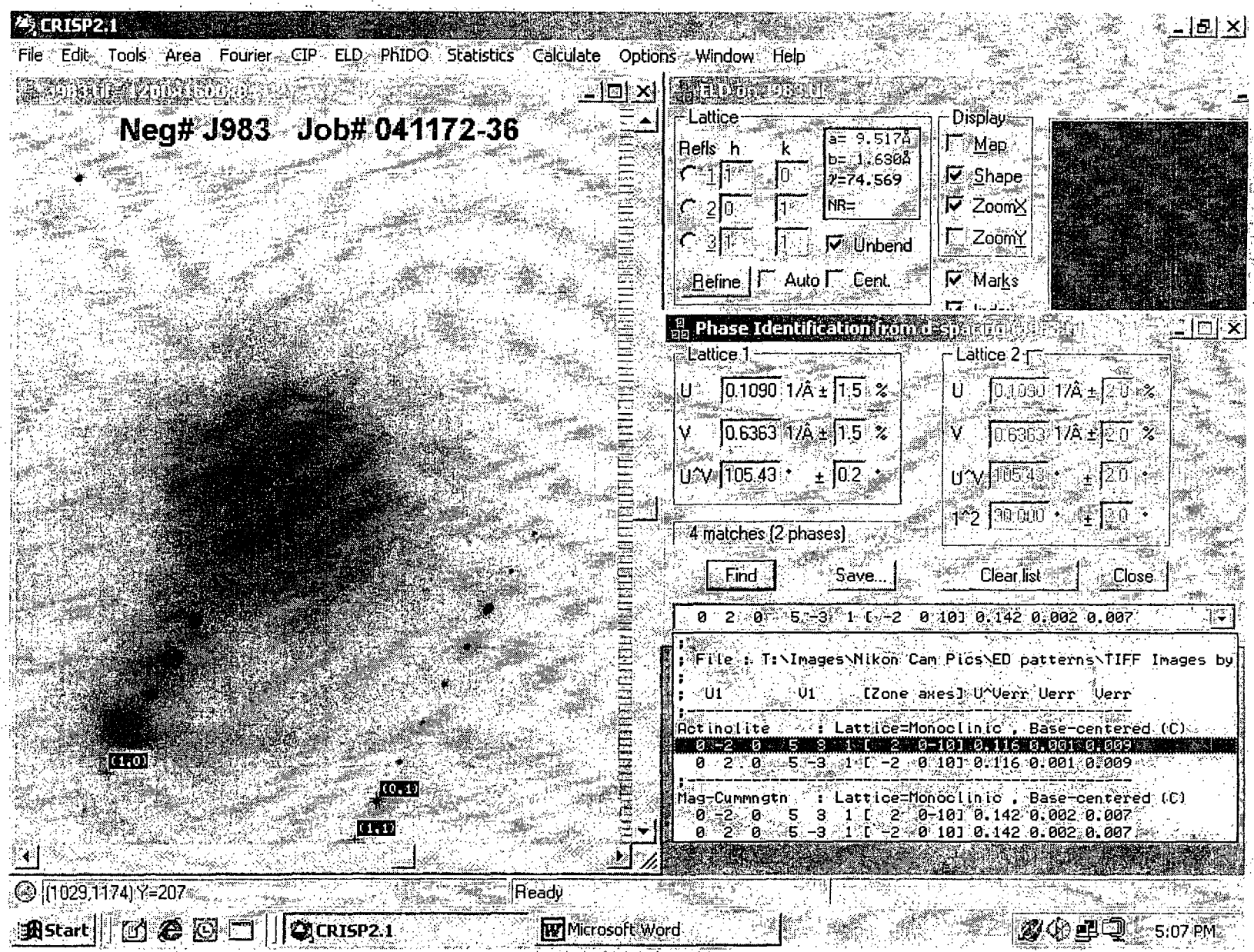
	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	58.02	Si+4	7.7396	7.7396							
Al2O3	3.16	Al+3	0.4968	0.2604	**0.2364**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	4.22	Fe+3	0.2076			0.2076	0.0000				
MgO	23.22	Mg+2	4.6177			4.5561	**0.0616**				
MnO	0	Fe+2	0.2401			0.0000	**0.2401**				
CaO	11.03	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0.03	Ca+2	1.5763					1.5763	0.0000		
K2O	0.31	Na+	0.0078					0.0078	**0.0000**	0.0000	0.0000
		K+	0.0527							0.0527	0.0000
Total	**99.99**		**Excess**	T site	**0.2364**	C site	**0.3017**	B site	**0**	A site	**0**
			Total	**8**		**5.0000**		**1.5841**		**0.0527**	**0.0000**
			%Fill	**100**		**100**		**79.2027**			

Prefix none
Name tremolite
Modifier none
Group Calcic Amphibole
041172
Sample # **041086-30-4-7**

Values		Satisfied Conditions
(Ca,Na)@B	1.58	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.01	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.58	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.05	Si > 7.5
Mg/(Mg+Fe2)	0.95	(Mg/(Mg+Fe2))>= 0.9
Si	7.74	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[1 0 -5]

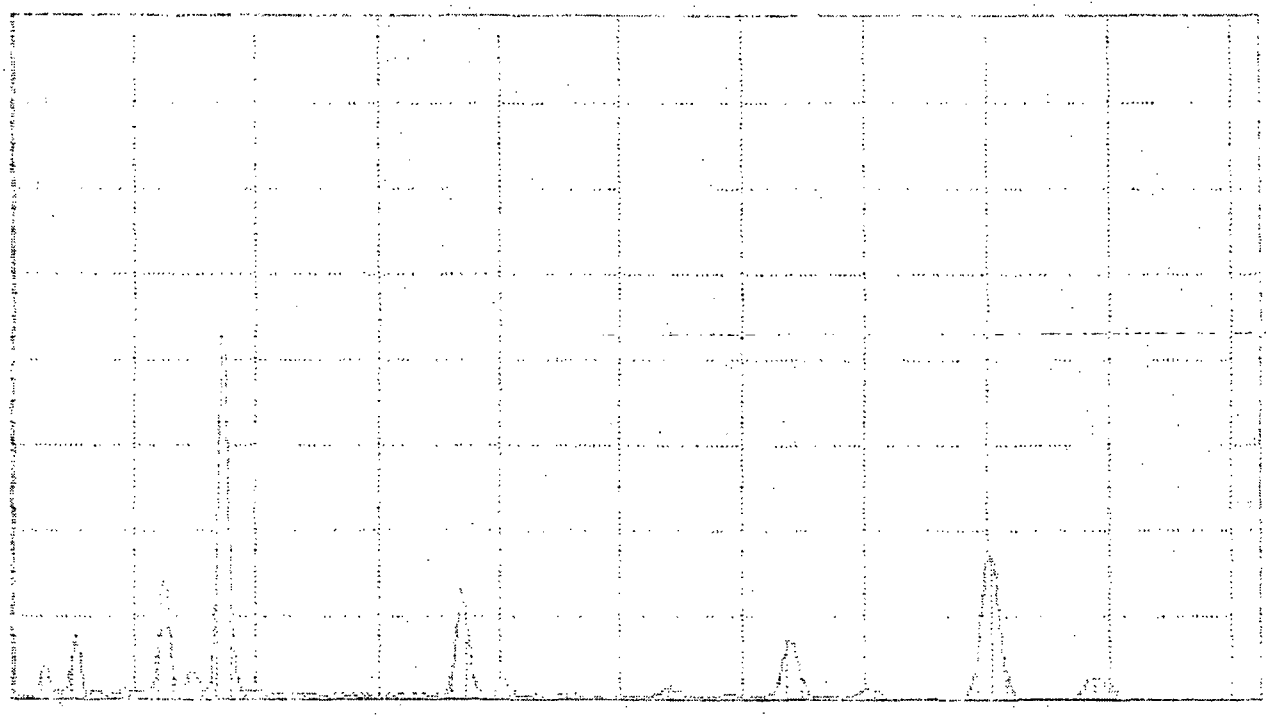


NAK NORM EDSCNTR MINMAX KDS/ALK EDIT

04:172-16 [illegible]

ELEMENT	[illegible]	[illegible] FACTOR	REL/GRAD	ATOM%	FI WTX	WT%	FORMULA
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]-K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]-K	765	0.750	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]-K	[illegible]	[illegible]	0.003	[illegible]	[illegible]	[illegible]	[illegible]
LA-K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]-K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]-K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]	[illegible]	[illegible]		

TI-5500 University of Washington / JEN THU [illegible] NOV-84 10:35
CUP-[illegible] © [illegible]



0.000 VTL = [illegible] [illegible]
ZS 04:172-36 S/717

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	56.77	Si+4	7.9811	7.9811							
Al2O3	2.44	Al+3	0.4043	0.0189	0.3853						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	14.37	Fe+3	0.0152			0.0152	0.0000				
MgO	12.95	Mg+2	2.7142			2.7142	0.0000				
MnO	0	Fe+2	1.6724			1.6724	0.0000				
CaO	13.36	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	2.0122					2.0000	0.0122		
K2O	0.11	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0197							0.0197	0.0000
Total	100		Excess	T site	0.3853	C site	0.0000	B site	0.0122016	A site	0
			Total	8		4.7871		2.0000		0.0197	0.0000
			%Fill	100		95.7423		100			

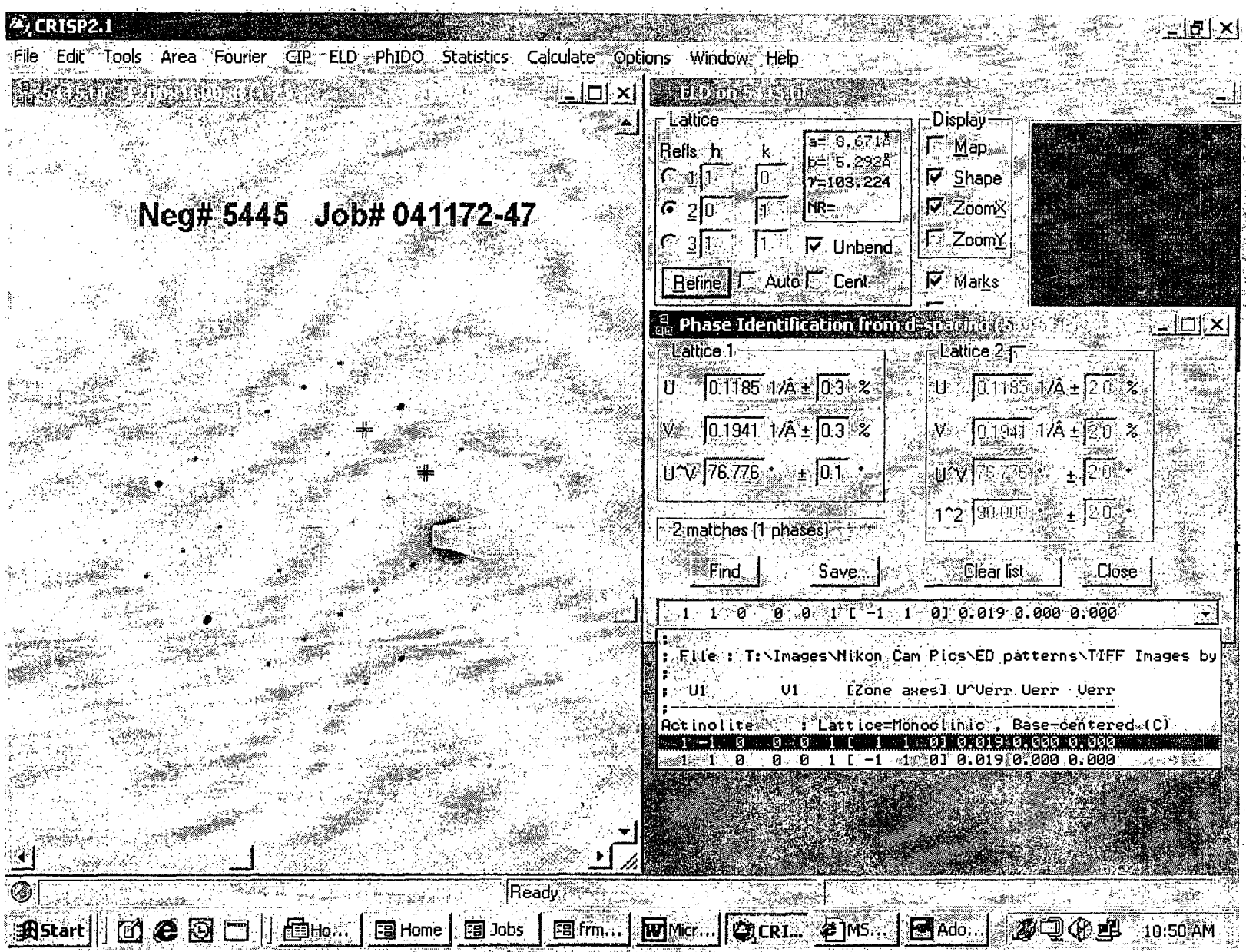
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041172-36-717

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.02	Si > 7.5
Mg/(Mg+Fe2)	0.62	(Mg/(Mg+Fe2))< 0.9
Si	7.98	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[110]



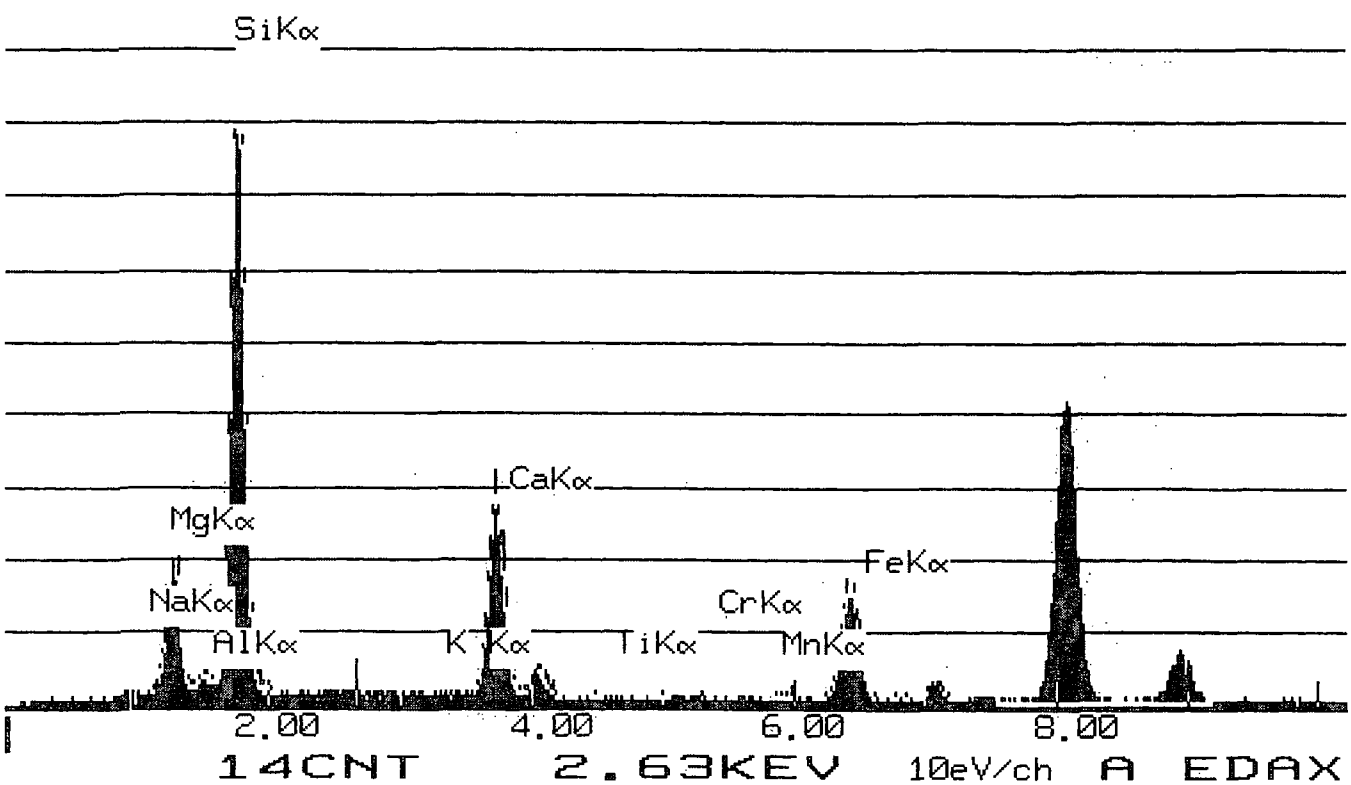
INTE-% :
LABEL = 041172-47 SP 15336
09-NOV-72 18:53:39
28.895 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	73.853	10.465	17.352
ALK	5.918	0.504	0.952
SIK	335.763	26.759	57.247
CAK	116.593	8.859	12.396
TIK	0.485	0.052	0.087
CRK	0.623	0.066	0.096
MNK	2.353	0.258	0.333
FEK	79.944	8.069	11.537

TOTAL			100.000

USED PEIF: USER

08-NOV-04 18:54:01 SUPER QUANT
RATE= 14CPS TIME= 29LSEC
FS= 1057/ 1057 PRST= 200LSEC
A =041172-47 SP 15336



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	57.247	Si+4	7.9203	7.9203							
Al2O3	0.952	Al+3	0.1552	0.0797	**0.0755**						
TiO2	0.087	Ti+4	0.0091	0.0000	**0.0091**						
Cr2O3	0.096	Cr+3	0.0105			0.0105	0.0000				
Fe(total)O	11.537	Fe+3	0.2642			0.2642	0.0000				
MgO	17.352	Mg+2	3.5790			3.5790	**0.0000**				
MnO	0.333	Fe+2	1.0411			1.0411	**0.0000**				
CaO	12.396	Mn+2	0.0390			0.0207	**0.0184**				
Na2O	0	Ca+2	1.8373					1.8373	0.0000		
K2O	0	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	**100**		**Excess**	T site	**0.0845**	C site	**0.0184**	B site	**0**	A site	**0**
			Total	**8**		**5.0000**		**1.8373**		**0.0000**	**0.0000**
			%Fill	**100**		**100**		**91.8672**			

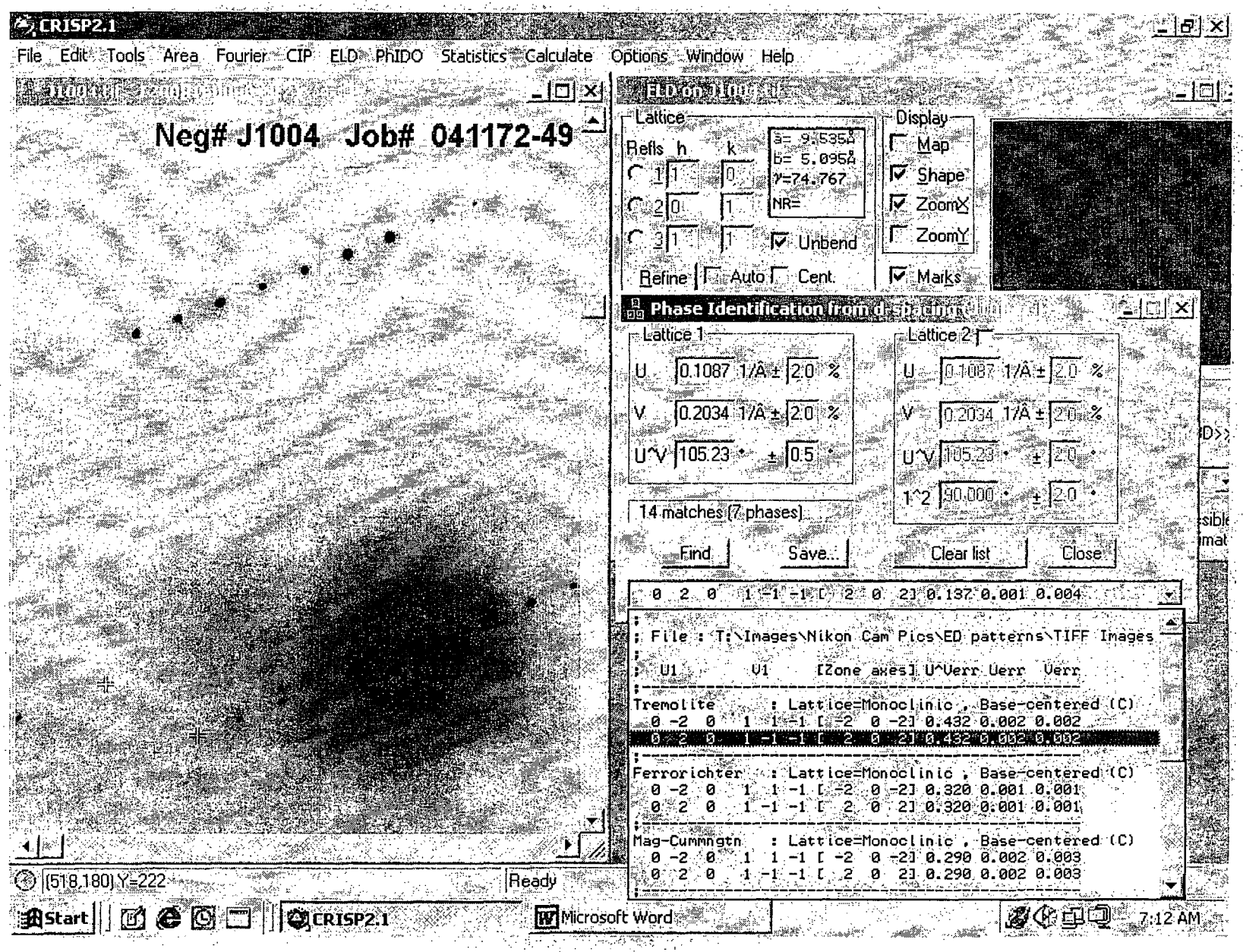
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # **041172-47-15336**

Values		Satisfied Conditions
(Ca,Na)@B	1.84	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.84	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.77	(Mg/(Mg+Fe2))< 0.9
Si	7.92	

Mineral Analysis Program (Version 5.0)

TREMOLITE
[101]



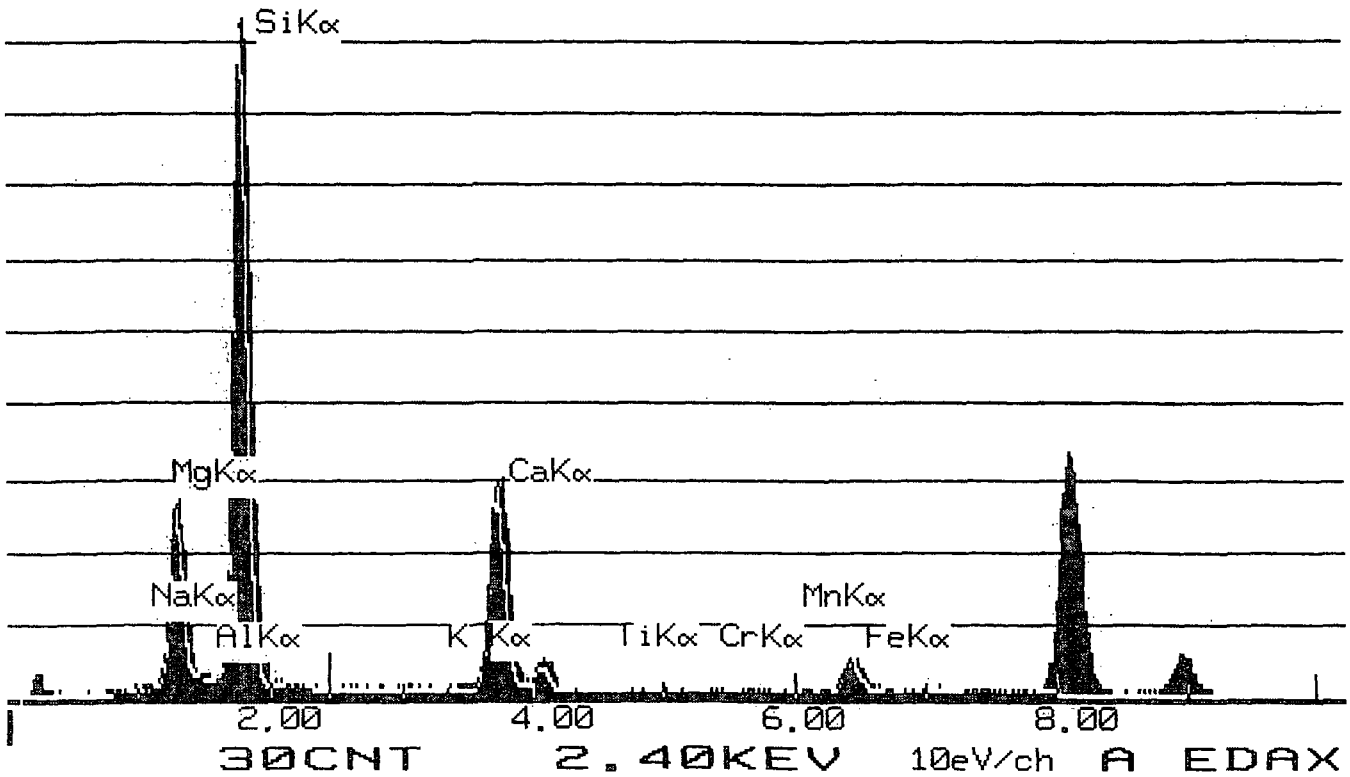
INTE-% :
LABEL = 041172-49 SP 15323
23-NOV-72 02:30:16
60.352 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	90.006	13.217	21.915
SIK	345.193	28.510	60.993
K K	0.978	0.134	0.162
CAK	123.311	9.710	13.586
TIK	1.259	0.140	0.233
MNK	0.580	0.066	0.085
FEK	20.231	2.116	3.026

TOTAL			100.000

USED PEIF: USER

22-NOV-04 02:30:39 SUPER QUANT
RATE= 13CPS TIME= 60LSEC
FS= 2259/ 2259 PRST= 200LSEC
A =041172-49 SP 15323



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	60.993	Si+4	8.0000	8.0000							
Al2O3	0	Al+3	0.0000	0.0000	**0.0000**						
TiO2	0.233	Ti+4	0.0388	0.0000	**0.0388**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	3.026	Fe+3	0.0107			0.0107	0.0000				
MgO	21.915	Mg+2	4.3922			4.3922	**0.0000**				
MnO	0.085	Fe+2	0.3515			0.3515	**0.0000**				
CaO	13.586	Mn+2	0.0269			0.0269	**0.0000**				
Na2O	0	Ca+2	1.9651					1.9651	0.0000		
K2O	0.162	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0406							0.0406	0.0000
Total	100		Excess	T site	**0.0388**	C site	**0.0000**	B site	**0**	A site	**0**
			Total	8		4.8201		1.9651		0.0406	0.0000
			%Fill	100		96.4024		98.2527			

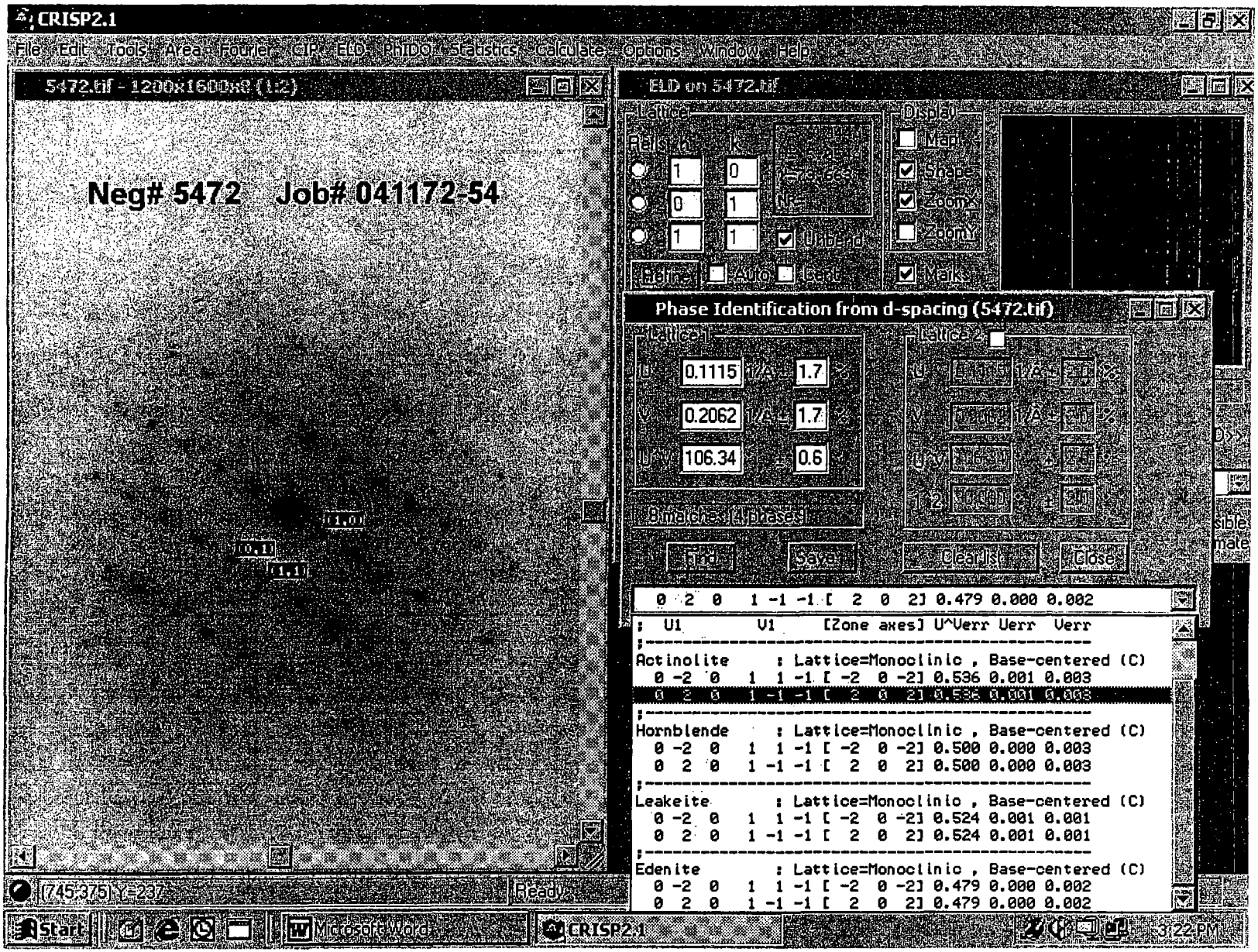
Prefix	none
Name	tremolite
Modifier	none
Group	Calcic Amphibole

Sample # 041172-49-15323

Values		Satisfied Conditions
(Ca,Na)@B	1.97	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.97	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.04	Si > 7.5
Mg/(Mg+Fe2)	0.93	(Mg/(Mg+Fe2))>= 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[1 0 1]
041172-54 Neg #5472



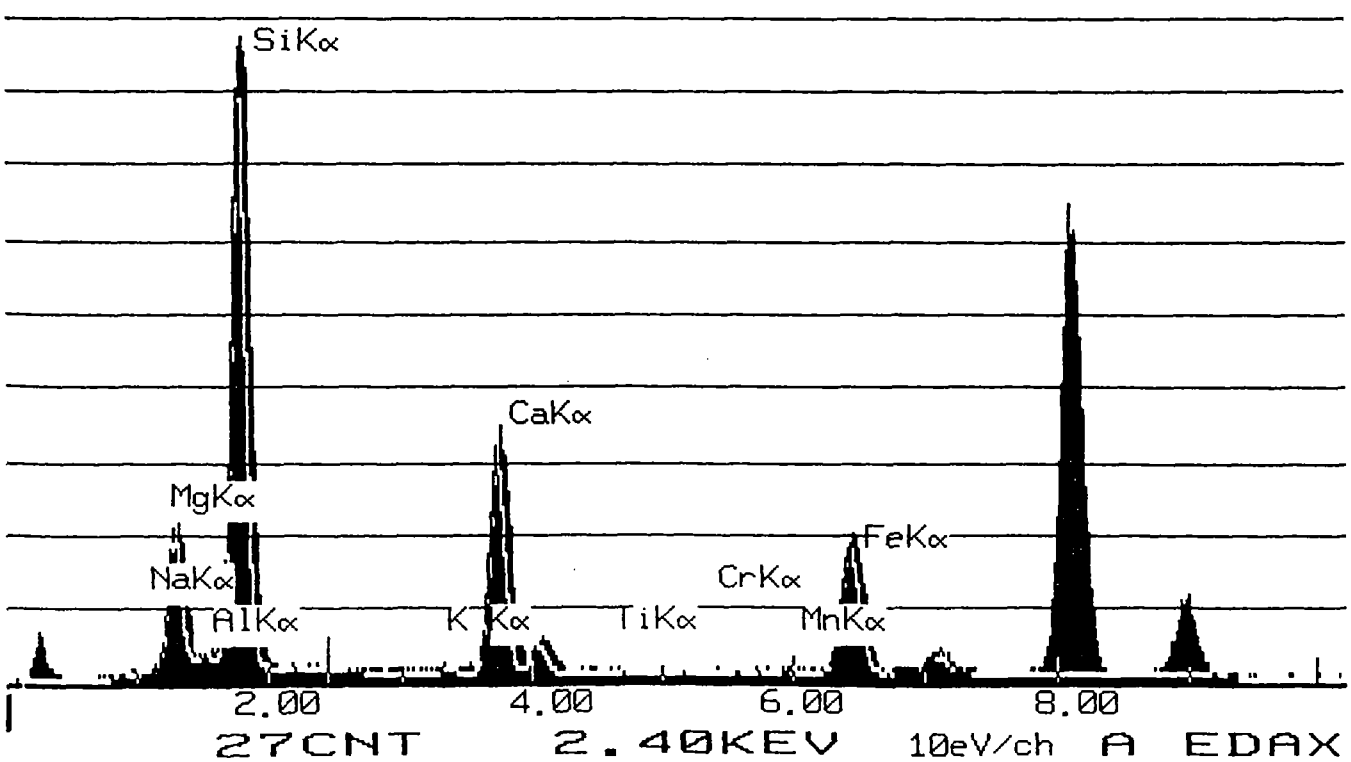
INTE-% :
LABEL = 041172-54 15350
23-NOV-72 02:47:56
36.174 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	91.557	10.166	16.856
ALK	2.847	0.190	0.359
SIK	409.768	25.588	54.742
K K	3.151	0.327	0.394
CAK	176.369	10.500	14.692
TIK	1.382	0.116	0.194
MNK	1.355	0.116	0.150
FEK	111.544	8.822	12.613

TOTAL			100.000

USED PEIF: USER

22-NOV-04 02:48:20 SUPER QUANT
RATE= 0CPS TIME= 36LSEC
FS= 1739/ 1739 PRST= 200LSEC
A =041172-54 15350



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.742	Si+4	7.7604	7.7604							
Al2O3	0.359	Al+3	0.0600	0.0600	**0.0000**						
TiO2	0.194	Ti+4	0.0207	0.0207	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.613	Fe+3	0.0135			0.0135	0.0000				
MgO	16.856	Mg+2	3.5624			3.5624	**0.0000**				
MnO	0.15	Fe+2	1.4802			1.4241	**0.0561**				
CaO	14.692	Mn+2	0.0180			0.0000	**0.0180**				
Na2O	0	Ca+2	2.2314					1.9259	0.3054		
K2O	0.394	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0712							0.0712	0.0000
Total	100		Excess	T site	**0.0000**	C site	**0.0741**	B site	**0.3054406**	A site	**0**
			Total	7.8411		5.0000		1.9259		0.0712	0.0000
			%Fill	98.014		100		96.2956			

Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

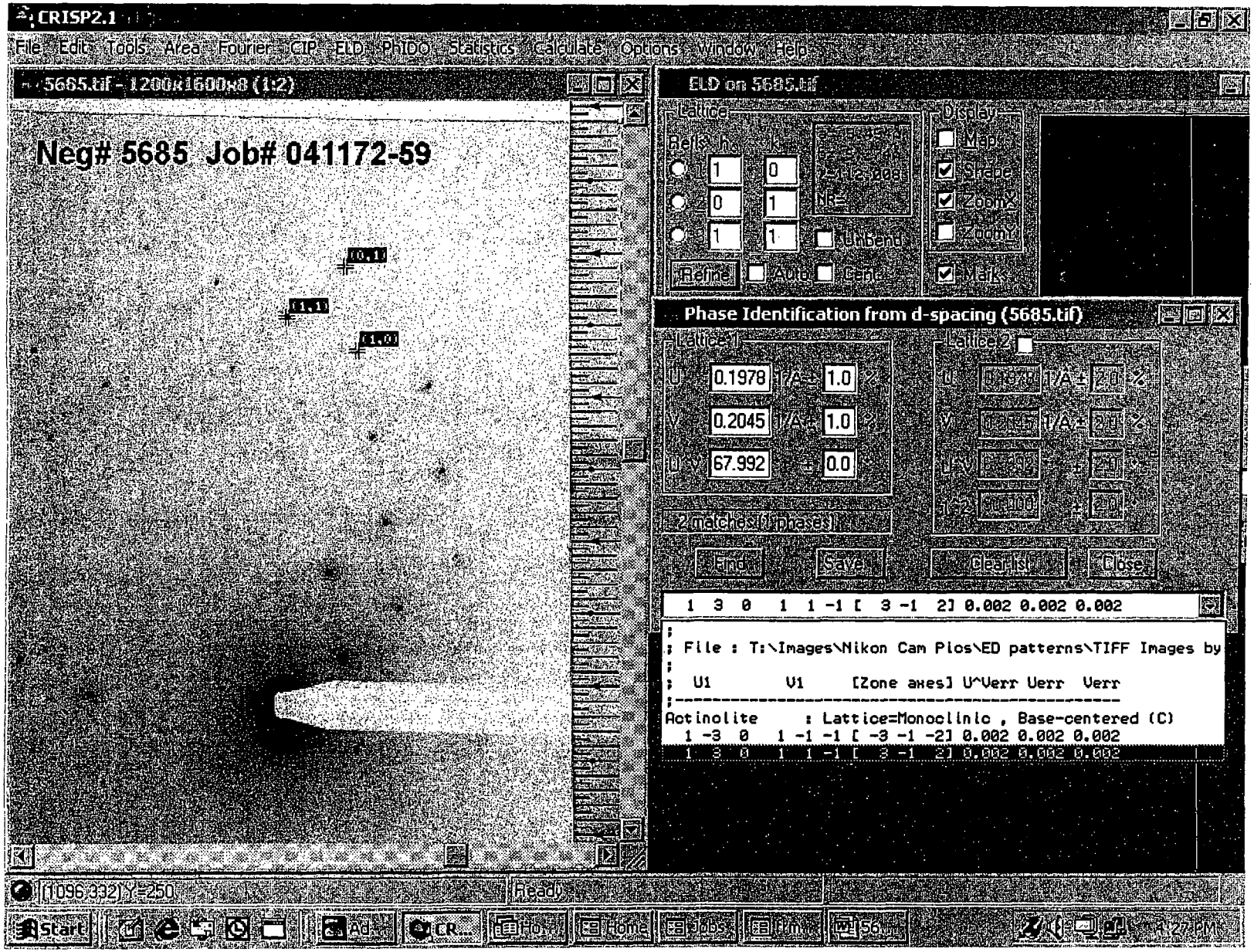
Sample # *041172-54-15350*

Values		Satisfied Conditions
(Ca,Na)@B	1.93	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.93	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.07	Si > 7.5
Mg/(Mg+Fe2)	0.71	(Mg/(Mg+Fe2))< 0.9
Si	7.76	

Mineral Analysis Program (Version 5.0)

ACTINOLITE

[3 -1 2]

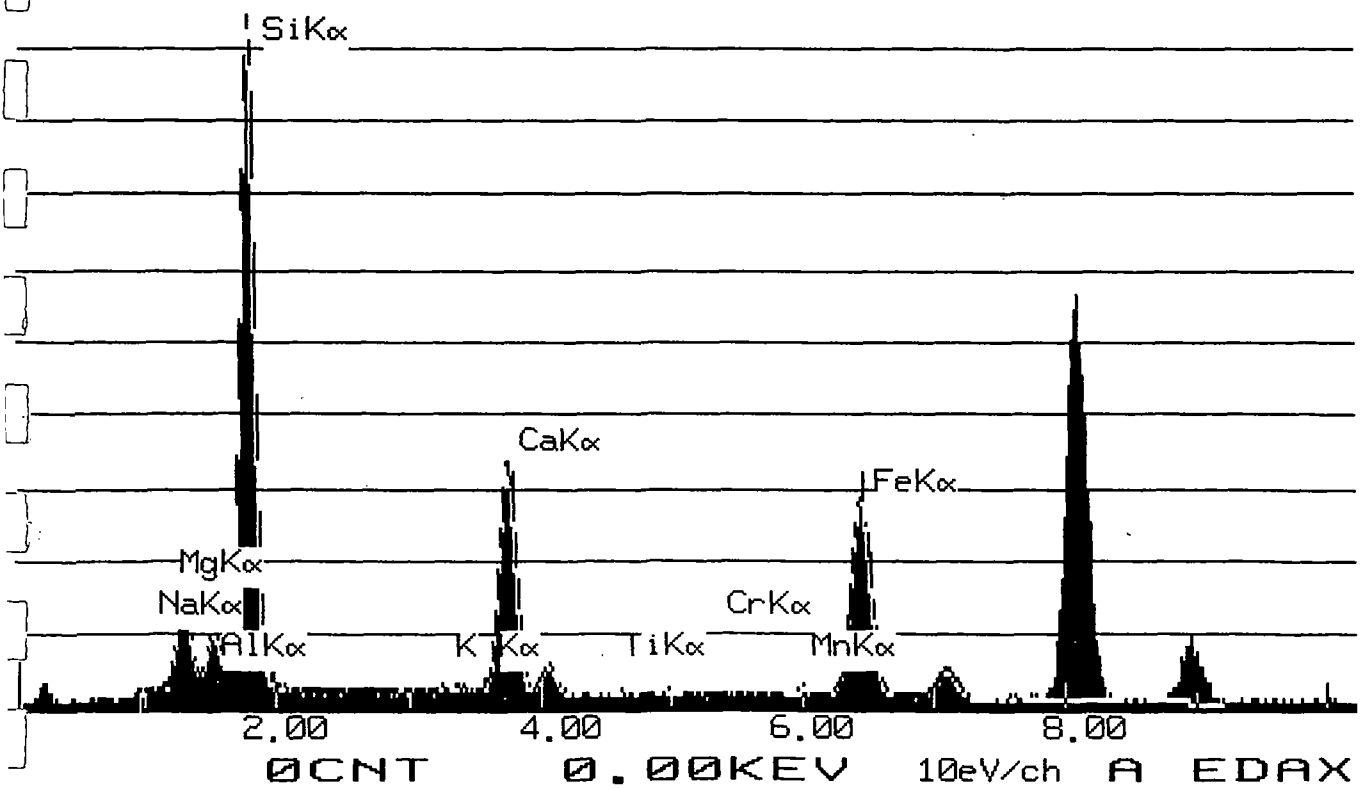


INTE-% :
LABEL = 041172-59 15537
10-DEC-72 02:15:18
80.374 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	20.330	6.637	11.005
ALK	11.036	2.164	4.089
SIK	134.696	24.733	52.912
K K	0.684	0.209	0.252
CAK	55.404	9.699	13.571
MNK	0.622	0.157	0.203
FEK	54.035	12.567	17.967
TOTAL			100.000

USED PEIF: USER

09-DEC-04 02:16:27 SUPER QUANT
RATE= 1016CPS TIME= 80LSEC
FS= 1138/ 1138 PRST= 200LSEC
A =041172-59 15537



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	52.912	Si+4	7.6344	7.6344							
Al2O3	4.089	Al+3	0.6953	0.3656	**0.3297**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	17.967	Fe+3	0.0195			0.0195	0.0000				
MgO	11.005	Mg+2	2.3672			2.3672	**0.0000**				
MnO	0.203	Fe+2	2.1460			2.1460	**0.0000**				
CaO	13.571	Mn+2	0.0248			0.0248	**0.0000**				
Na2O	0	Ca+2	2.0978					2.0000	0.0978		
K2O	0.252	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0464							0.0464	0.0000
Total	**99.999**		**Excess**	T site	**0.3297**	C site	**0.0000**	B site	**0.0977558**	A site	**0**
			Total	**8**		**4.8872**		**2.0000**		**0.0464**	**0.0000**
			%Fill	**100**		**97.7449**		**100**			

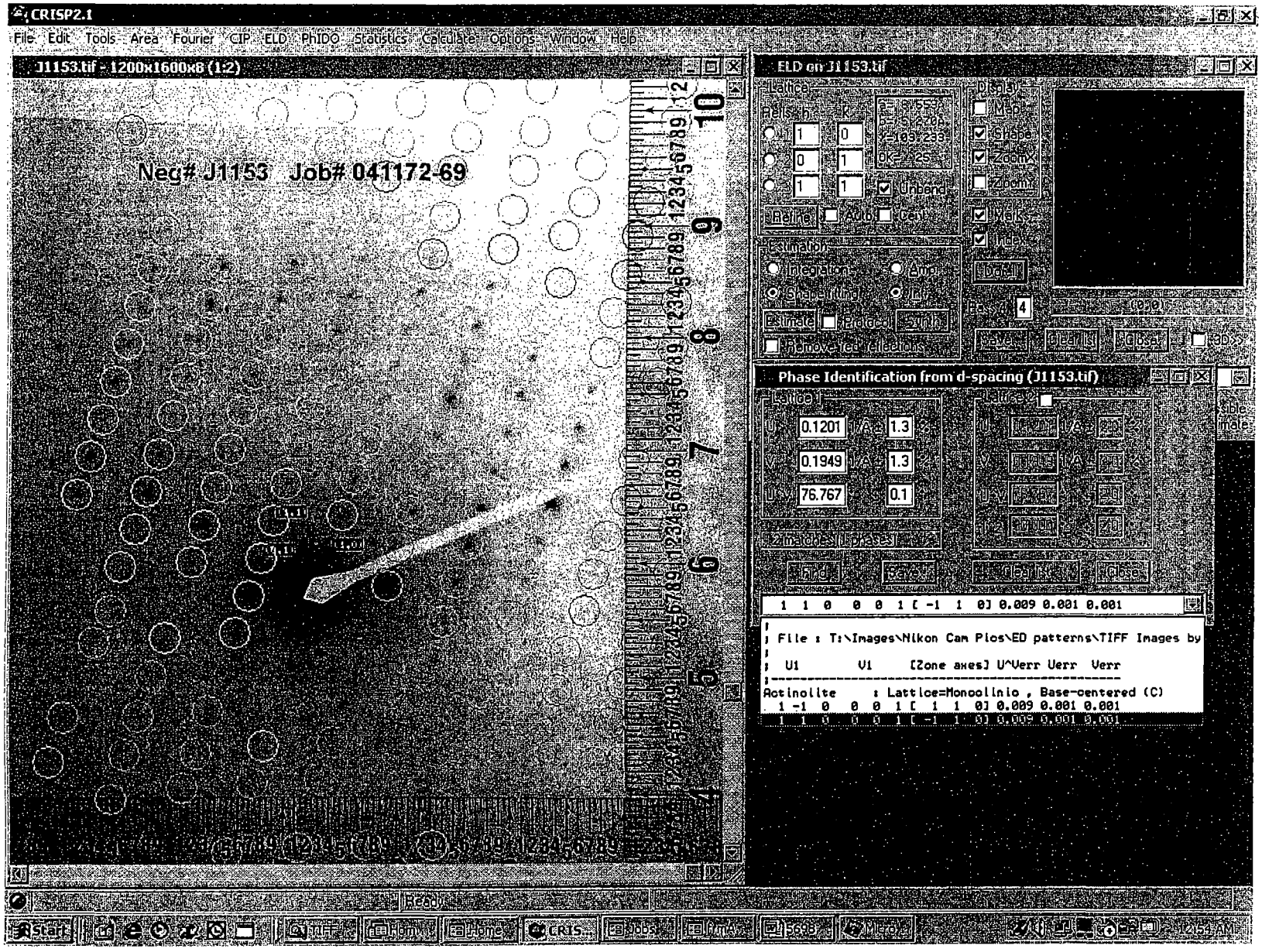
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # **041172-59-15537**

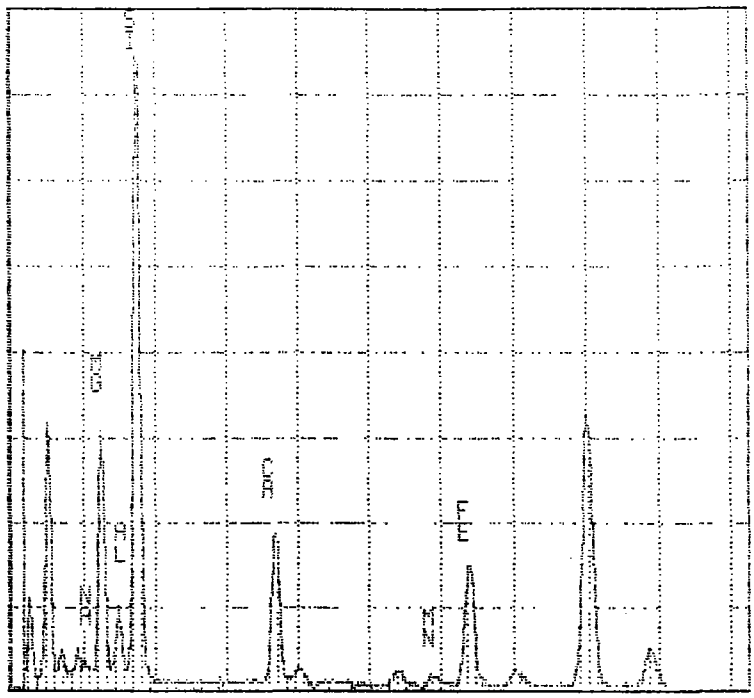
Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.05	Si > 7.5
Mg/(Mg+Fe2)	0.52	(Mg/(Mg+Fe2))< 0.9
Si	7.63	

Mineral Analysis Program (Version 5.0)

Sample 041172-69
Neg #1153
ACTINOLITE
[1 1 0]



TX-5030 University of Washington / JEOL SAT 11-09-84 12:15:2
Cursor: 0.000keV = 0



0.000 S- 5 VFS = 1024 10.240
0 EXEC(7-C) MATH LABEL

```
IN FLEXTRAN [13-B]
*Z\ZX 'SQMTF'
SQMTF -3B/80

SQMTF: QUANTIFY
 Standardless Analysis

Refit _NAK' _NAK"
 Refit _ALK' _ALK" _NAK
Chi-sqd = 4.13

 Element          Net Counts
  Si-K          11017 +/-   153
   Mg-K          3680 +/-   123
  Al-K           1136 +/-    78
   Ca-K          3427 +/-   117
  Fe-K           3251 +/-   111
   Na-K             0 +/-     0
  K -K            114 +/-    64


REF.S  EDS:SIK    EDS:MGK    EDS:ALK    EDS:CAK    EDS:FEK    EDS:NAK
  EDS:K K

041172-69 SP 842

EL-LINE   PEAK  K-FACTOR   CEL/CREF  ATOM%  EL WT%    WT%  FORMULA
 SI-K    11017    1.000      1.000   20.32   25.09   55.47  SIO2
MG-K     3680     1.000      0.334    7.92    8.65   14.41  MGO
 AL-K    1136     0.750      0.077    1.63    2.00    3.78  AL2O3
CA-K     3427     0.949      0.296    4.20    7.65   10.71  CAO
 FE-K    3251     1.399      0.413    4.79   10.79   15.28  FE2O3
NA-K        0     0.549      0.000    0.00    0.00    0.00  NA2O3
 K-K      114     1.059      0.011    0.16    0.29    0.34  K2O
O                           1.782   61.57   44.83
```

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	55.47	Si+4	7.7112	7.7112							
Al2O3	3.78	Al+3	0.6193	0.2888	**0.3304**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	15.28	Fe+3	0.6713			0.6713	0.0000				
MgO	14.41	Mg+2	2.9864			2.9864	**0.0000**				
MnO	0	Fe+2	1.0302			1.0118	**0.0184**				
CaO	10.71	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0	Ca+2	1.5950					1.5950	0.0000		
K2O	0.34	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0603							0.0603	0.0000
Total	99.99		Excess	T site	**0.3304**	C site	**0.0184**	B site	**0**	A site	**0**
			Total	8		5.0000		1.5950		0.0603	0.0000
			%Fill	100		100		79.7523			

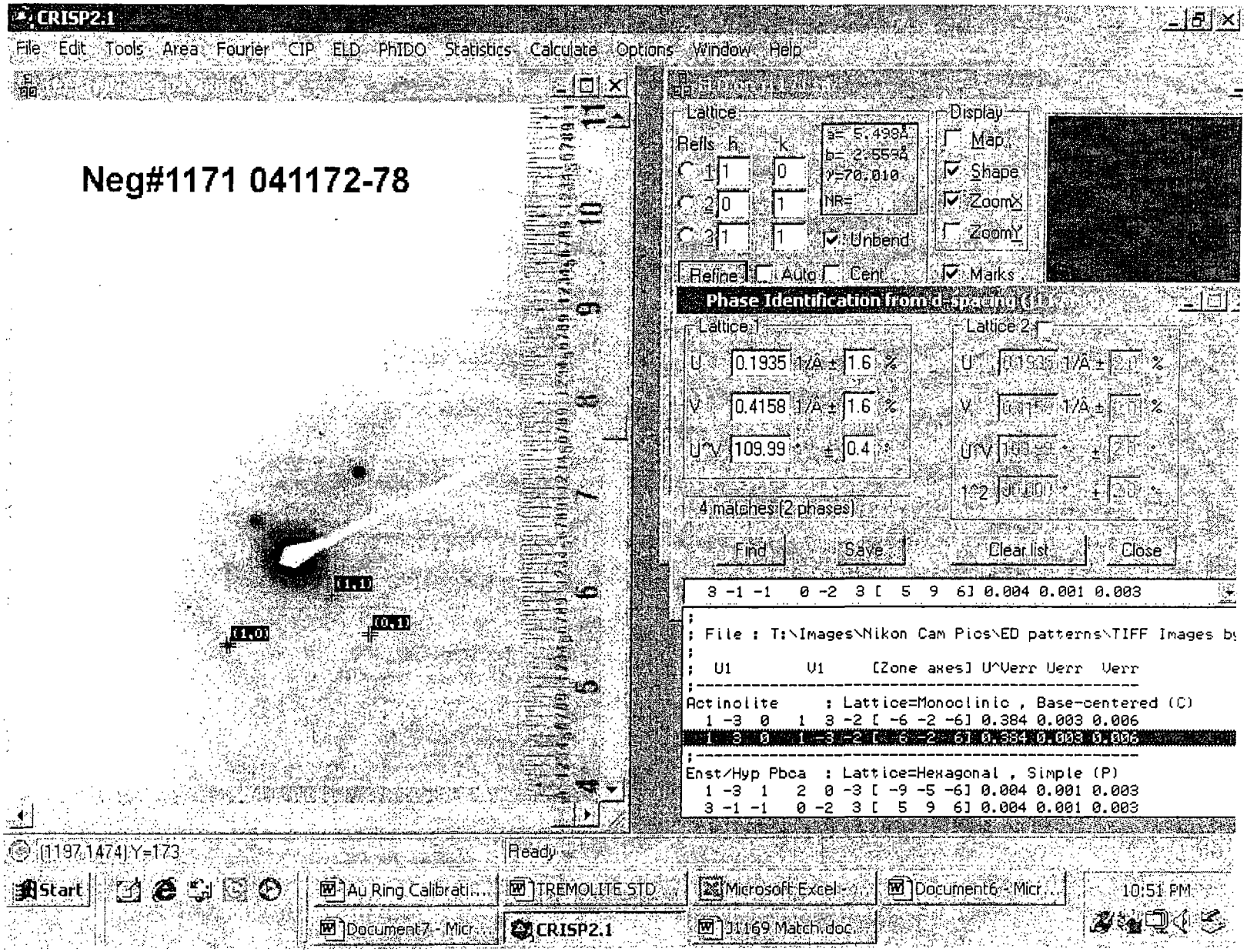
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041172-69-842

Values		Satisfied Conditions
(Ca,Na)@B	1.60	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.60	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.06	Si > 7.5
Mg/(Mg+Fe2)	0.74	(Mg/(Mg+Fe2))< 0.9
Si	7.71	

Mineral Analysis Program (Version 5.0)

Neg#J1171; Sample# 041172-78
ACTINOLITE
[3 1 3]



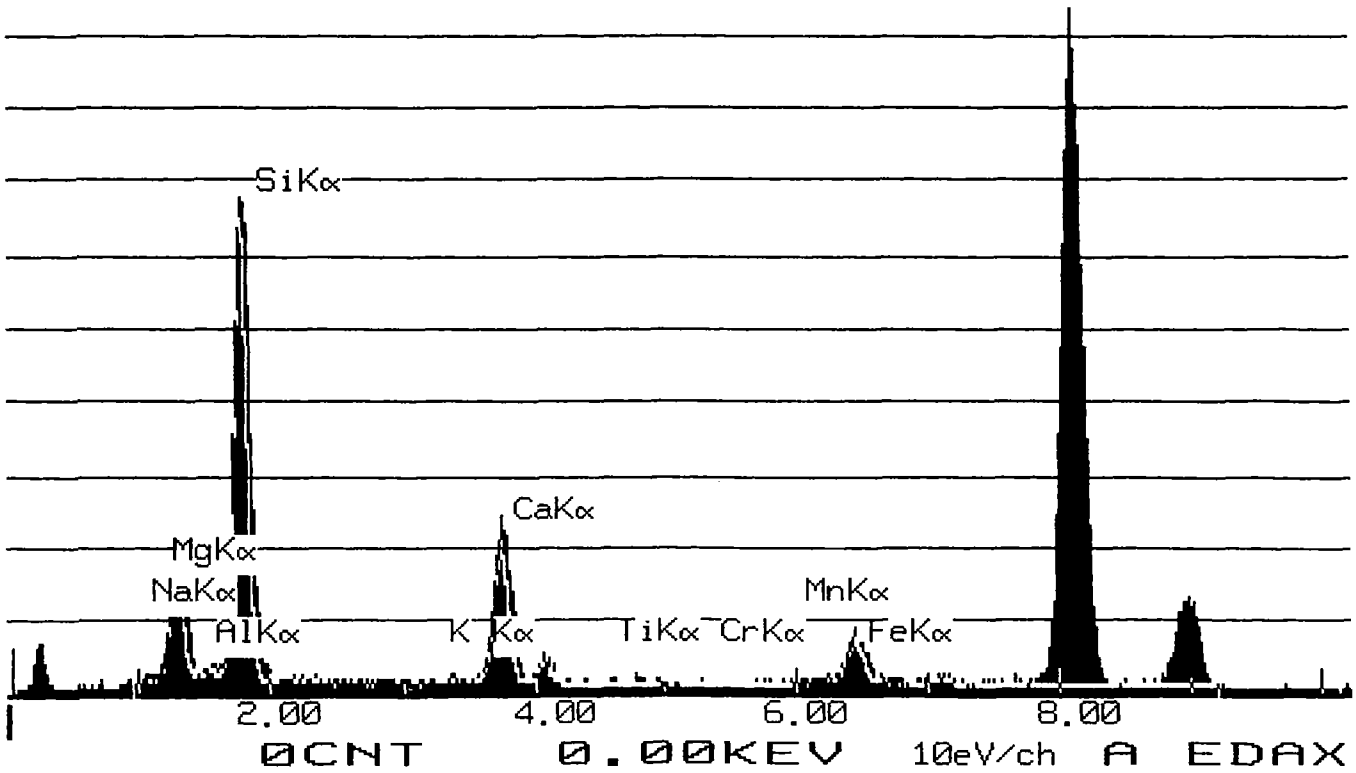
INTE-% :
LABEL = 041172-78 SP 15564
15-DEC-72 21:50:48
80.650 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	19.938	11.927	19.777
ALK	0.707	0.254	0.480
SIK	84.017	28.268	60.475
K K	0.273	0.153	0.184
CAK	28.803	9.240	12.928
FEK	10.105	4.306	6.157

TOTAL			100.000

USED PEIF: USER

14-DEC-04 21:51:44 SUPER QUANT
RATE= 190CPS TIME= 81LSEC
FS= 1021/ 1021 PRST= 200LSEC
A =041172-78 SP 15564



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	60.475	Si+4	8.0000	8.0000							
Al2O3	0.48	Al+3	0.0922	0.0000	**0.0922**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	6.157	Fe+3	0.0164			0.0164	0.0000				
MgO	19.777	Mg+2	4.0195			4.0195	**0.0000**				
MnO	0	Fe+2	0.7105			0.7105	**0.0000**				
CaO	12.928	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0	Ca+2	1.8982					1.8982	0.0000		
K2O	0.184	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0489							0.0489	0.0000
Total	100.001		Excess	T site	0.0922	C site	0.0000	B site	0	A site	0
			Total	8		4.8386		1.8982		0.0489	0.0000
			%Fill	100		96.7722		94.9087			

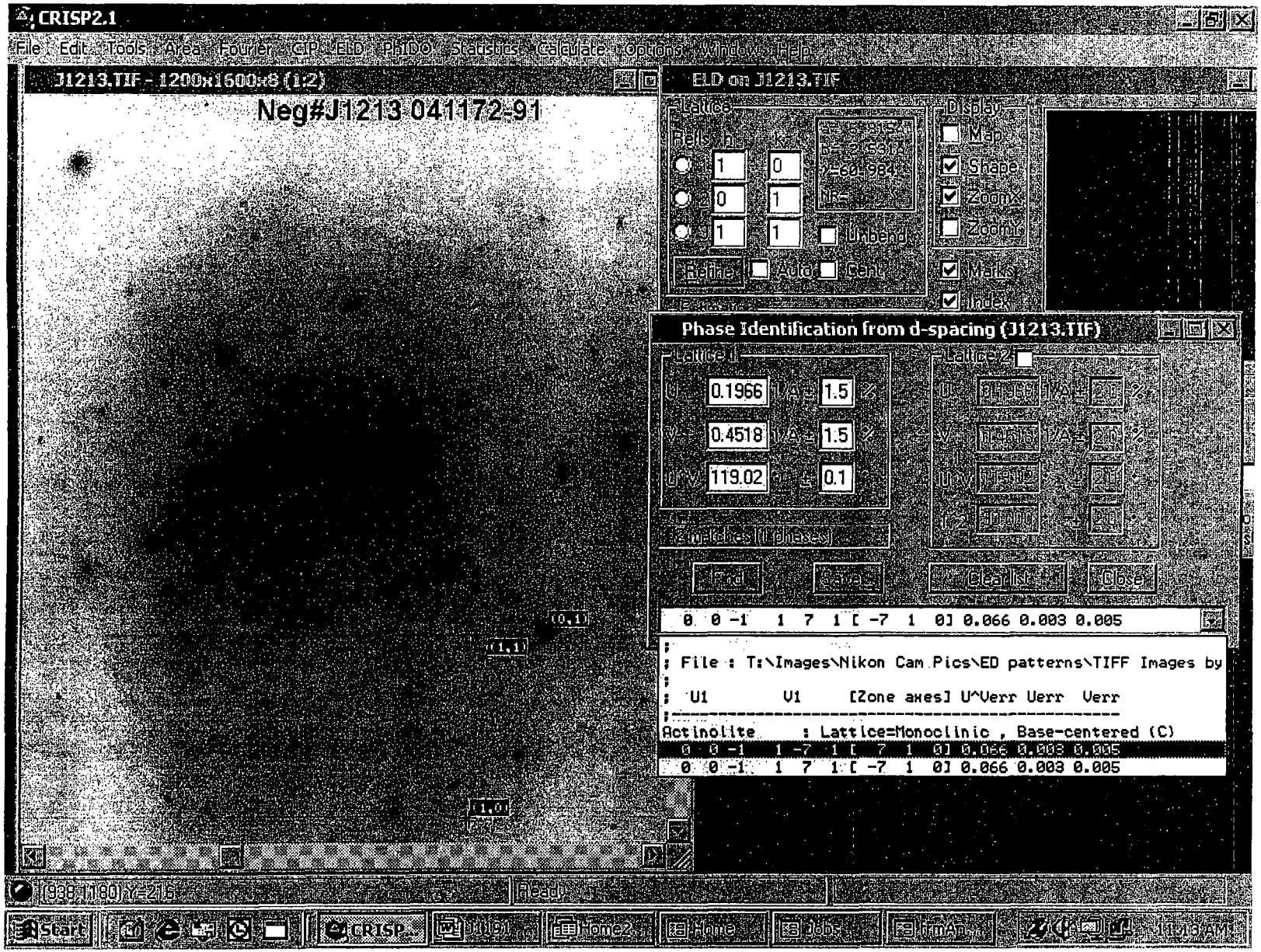
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041172-78-15564

Values		Satisfied Conditions
(Ca,Na)@B	1.90	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.90	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.05	Si > 7.5
Mg/(Mg+Fe2)	0.85	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

Neg#J1213; Sample# 041172-91
ACTINOLITE
[7 1 0]



QUANTIFY
Standardless Analysis

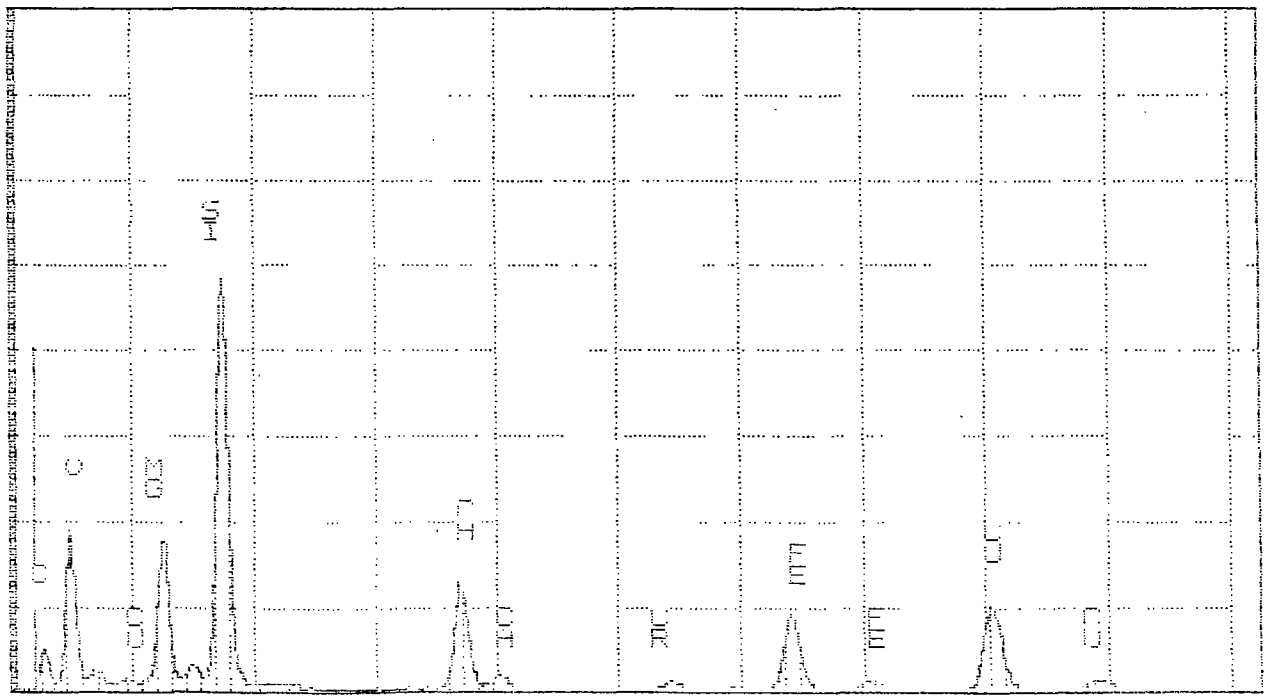
Refit _K' K' _K K"
Refit _ALK' _ALK" _NOK'
Chi-sqr = 7.24

Element	Net Counts	
Si-K	28449 +/-	250
Mg-K	9479 +/-	224
Al-K	1139 +/-	115
Ca-K	9226 +/-	181
Fe-K	7795 +/-	171
Na-K	724 +/-	118
K -K	77 +/-	41

0411/2-91 SP 897

EL-LINE	PEAK	K-FACTOR	CEL/CREF	ATOM%	EL WT%	WT%	FORMULA
SI-K	28449	1.000	1.000	20.78	24.55	56.89	SIO2
MG-K	9479	1.000	0.333	8.08	8.85	14.75	MGO
AL-K	1139	0.750	0.040	0.45	0.80	1.51	AL2O3
CA-K	9226	0.949	0.308	4.48	8.18	11.45	CAO
FE-K	7795	1.394	0.384	3.99	10.19	14.55	FEO
NA-K	724	0.549	0.014	0.35	0.37	0.76	NA2O
K-K	77	1.059	0.003	0.04	0.08	0.04	K2O
O			1.695	61.63	44.99		

TN-5500 University of Washington / .THOL THU 28-APR-94 14:48
Cursor: 0 000keV = 0



0 000 B- 5 VFs = 4096 10.240
30 041172-91 SP 897

1.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	56.89	Si+4	7.9844	7.9844							
Al2O3	1.51	Al+3	0.2498	0.0156	**0.2341**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	14.55	Fe+3	0.0768			0.0768	0.0000				
MgO	14.75	Mg+2	3.0862			3.0862	**0.0000**				
MnO	0	Fe+2	1.6222			1.6029	**0.0193**				
CaO	11.45	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0.76	Ca+2	1.7216					1.7216	0.0000		
K2O	0.09	Na+	0.2068					0.2068	**0.0000**	0.0000	0.0000
		K+	0.0161							0.0161	0.0000
Total	100		Excess	T site	0.2341	C site	0.0193	B site	0	A site	0
			Total	8		5.0000		1.9284		0.0161	0.0000
			%Fill	100		100		96.4194			

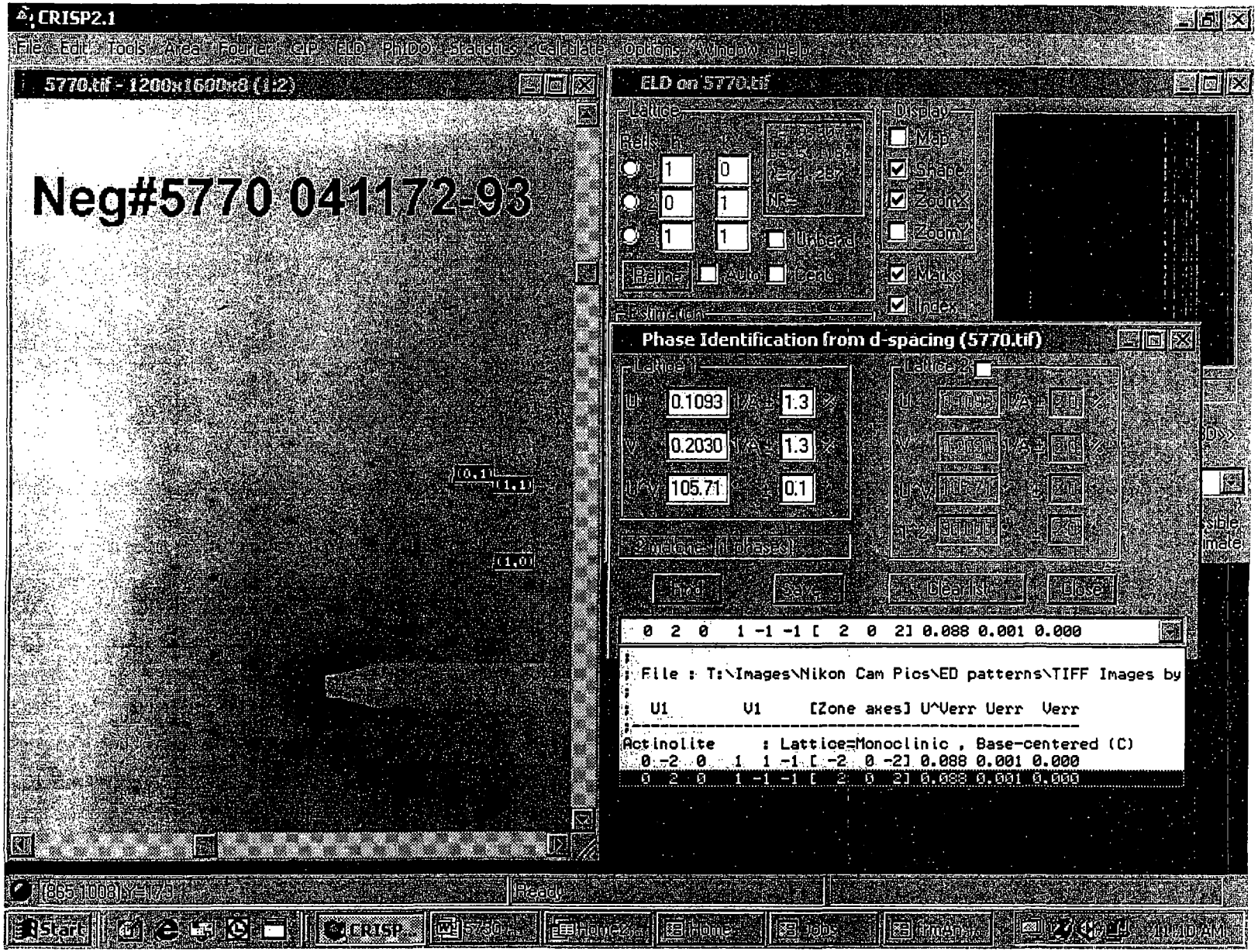
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041172-91-897

Values		Satisfied Conditions
(Ca,Na)@B	1.93	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.21	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.72	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.02	Si > 7.5
Mg/(Mg+Fe2)	0.66	(Mg/(Mg+Fe2))< 0.9
Si	7.98	

Mineral Analysis Program (Version 5.0)

Neg#5770; Sample# 041172-93
ACTINOLITE
[1 0 1]



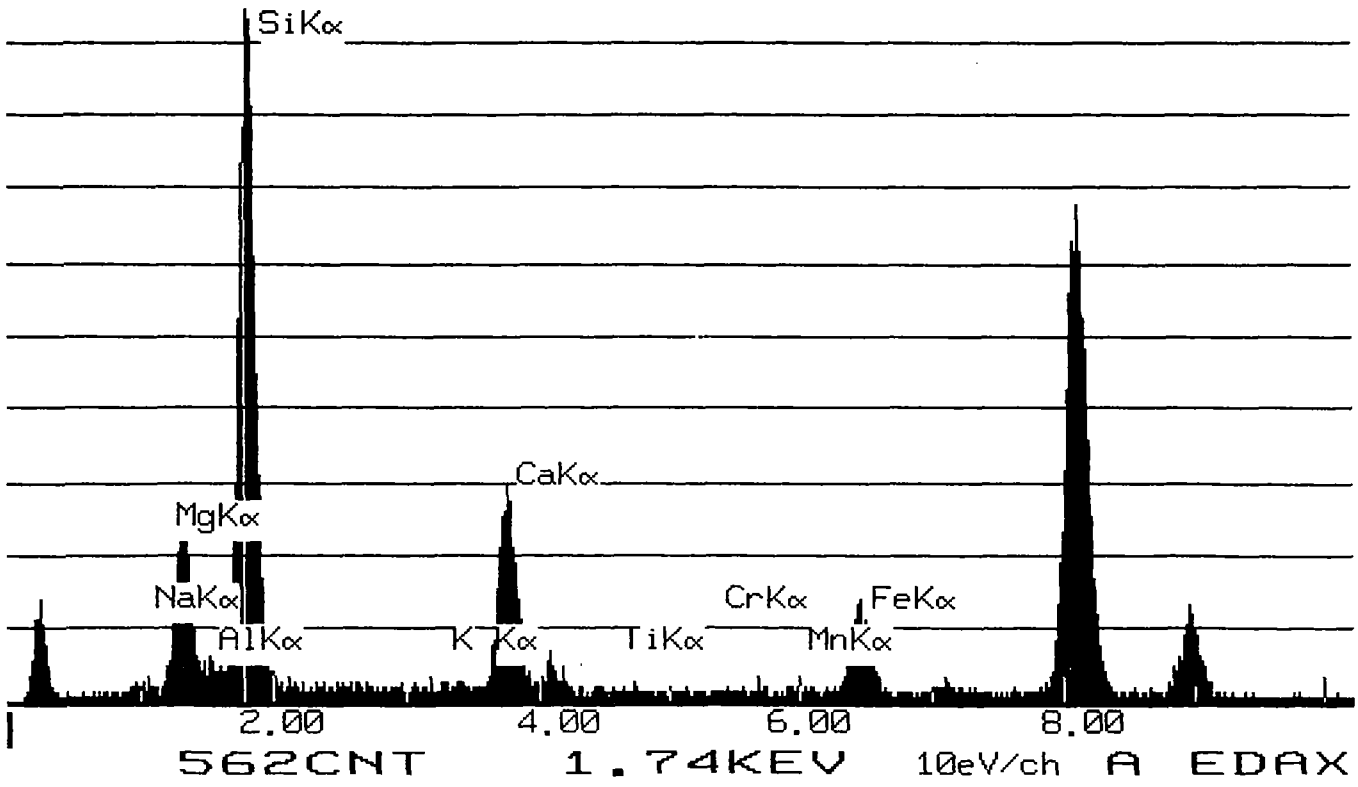
INTE-% :
LABEL = 041172-93 15617
24-DEC-72 03:36:19
65.106 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	21.058	10.724	17.782
SIK	98.547	28.227	60.387
K K	0.323	0.154	0.185
CAK	33.023	9.018	12.618
CRK	0.415	0.158	0.230
MNK	0.630	0.248	0.320
FEK	16.343	5.929	8.477
TOTAL			100.000

Bb-Aut
Actinolite

USED PEIF: USER

23-DEC-04 03:36:36 SUPER QUANT
RATE= 129CPS TIME= 65LSEC
FS= 718/ 718 PRST=9999LSEC
A =041172-93 15617



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	60.387	Si+4	8.0000	8.0000							
Al2O3	0	Al+3	0.0000	0.0000	**0.0000**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0.23	Cr+3	0.0383			0.0383	0.0000				
Fe(total)O	8.477	Fe+3	0.0215			0.0215	0.0000				
MgO	17.782	Mg+2	3.6678			3.6678	**0.0000**				
MnO	0.32	Fe+2	0.9860			0.9860	**0.0000**				
CaO	12.618	Mn+2	0.0659			0.0659	**0.0000**				
Na2O	0	Ca+2	1.8809					1.8809	0.0000		
K2O	0.185	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0540							0.0540	0.0000
Total	99.999		Excess	T site	**0.0000**	C site	**0.0000**	B site	**0**	A site	**0**
			Total	**8**		**4.7795**		**1.8809**		**0.0540**	**0.0000**
			%Fill	**100**		**95.5905**		**94.0462**			

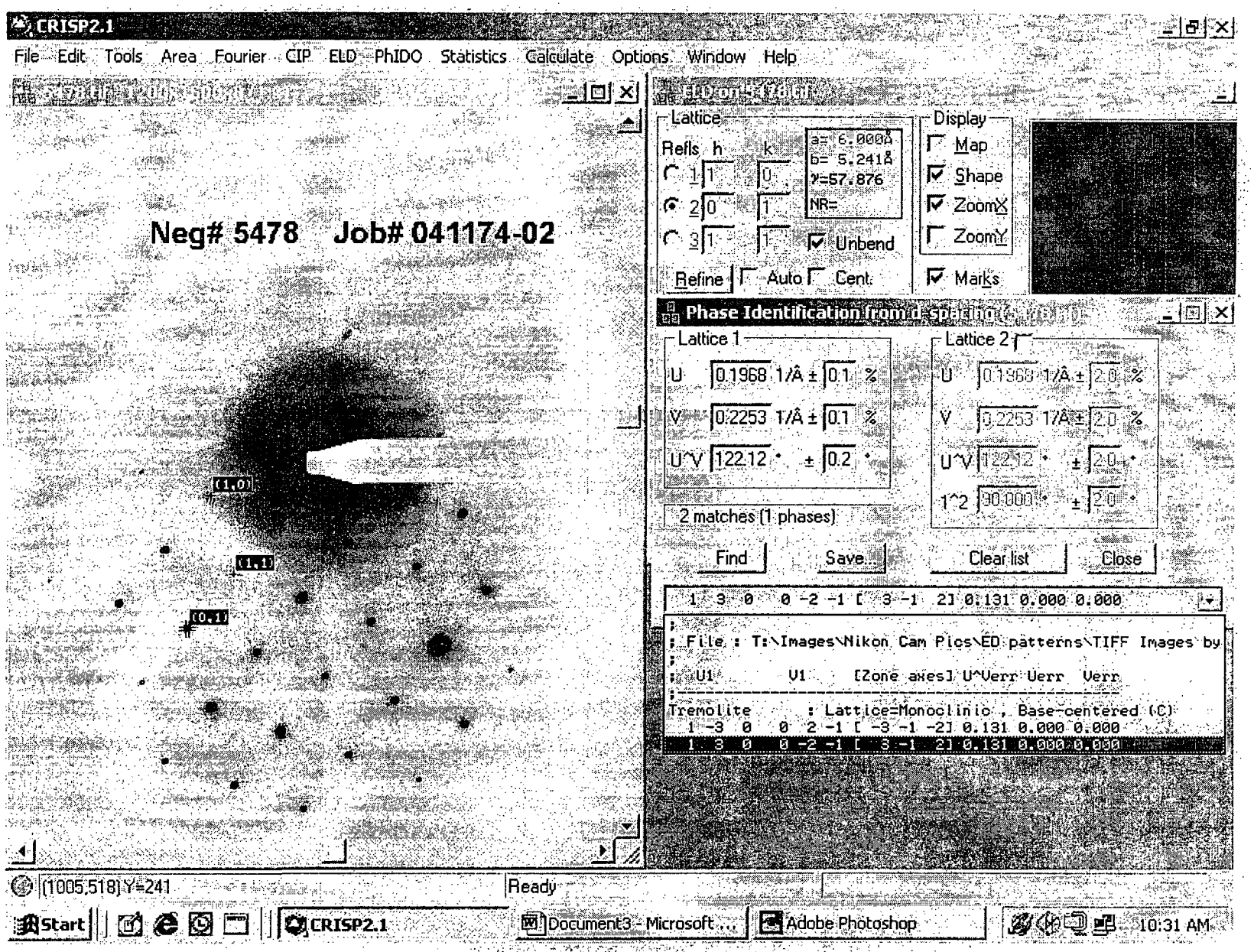
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041172-93-15617

Values		Satisfied Conditions
(Ca,Na)@B	1.88	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.88	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.05	Si > 7.5
Mg/(Mg+Fe2)	0.79	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

TREMOLITE
[3 -1 2]



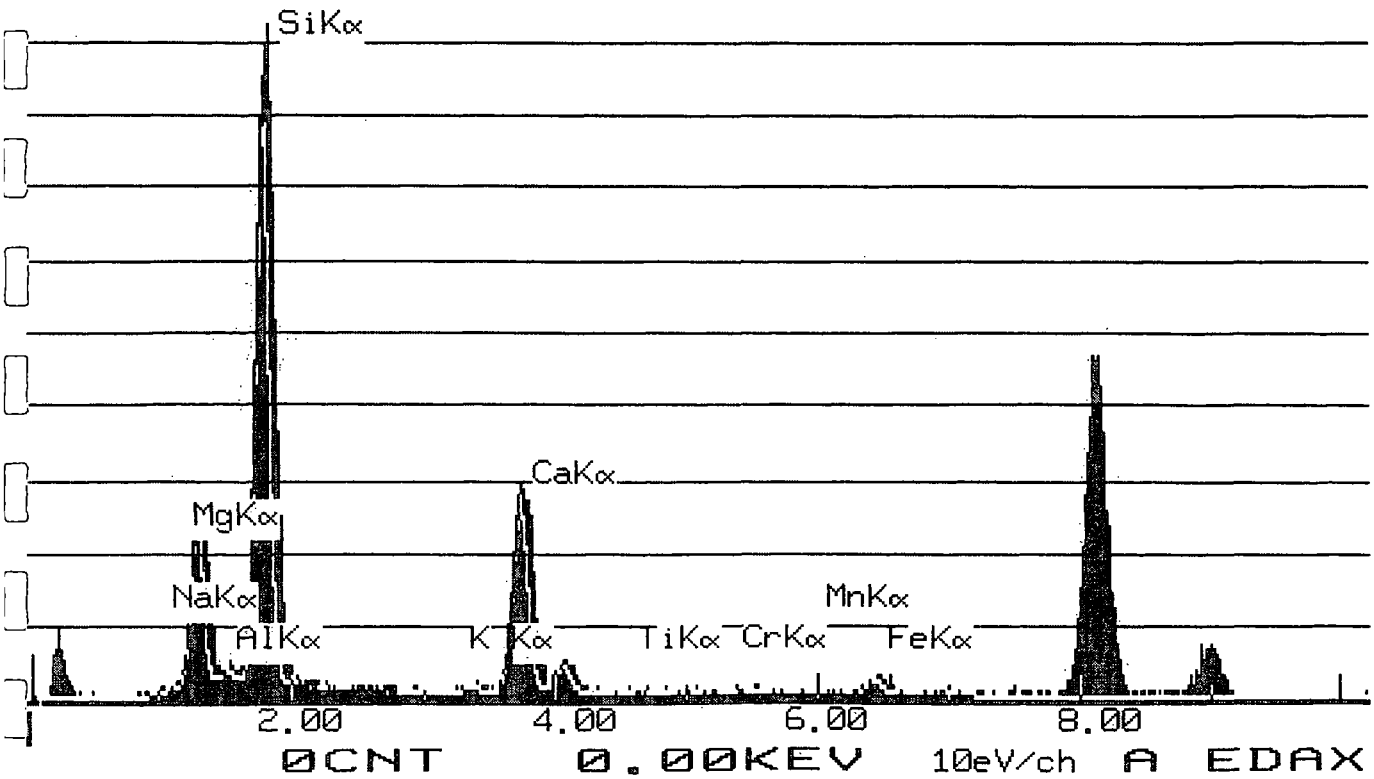
INTE-% :
LABEL = 041174-02 SP 15355
23-NOV-72 21:08:07
24.897 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
NAK	0.884	0.236	0.318
MGK	110.575	13.959	23.145
ALK	8.154	0.618	1.168
SIK	390.608	27.733	59.330
K K	3.494	0.412	0.497
CAK	147.246	9.967	13.946
FEK	12.411	1.116	1.596

TOTAL			100.000

USED PEIF: USER

22-NOV-04 21:08:31 SUPER QUANT
RATE= 0CPS TIME= 24LSEC
FS= 1146/ 1146 PRST= 200LSEC
A =041174-02 SP 15355



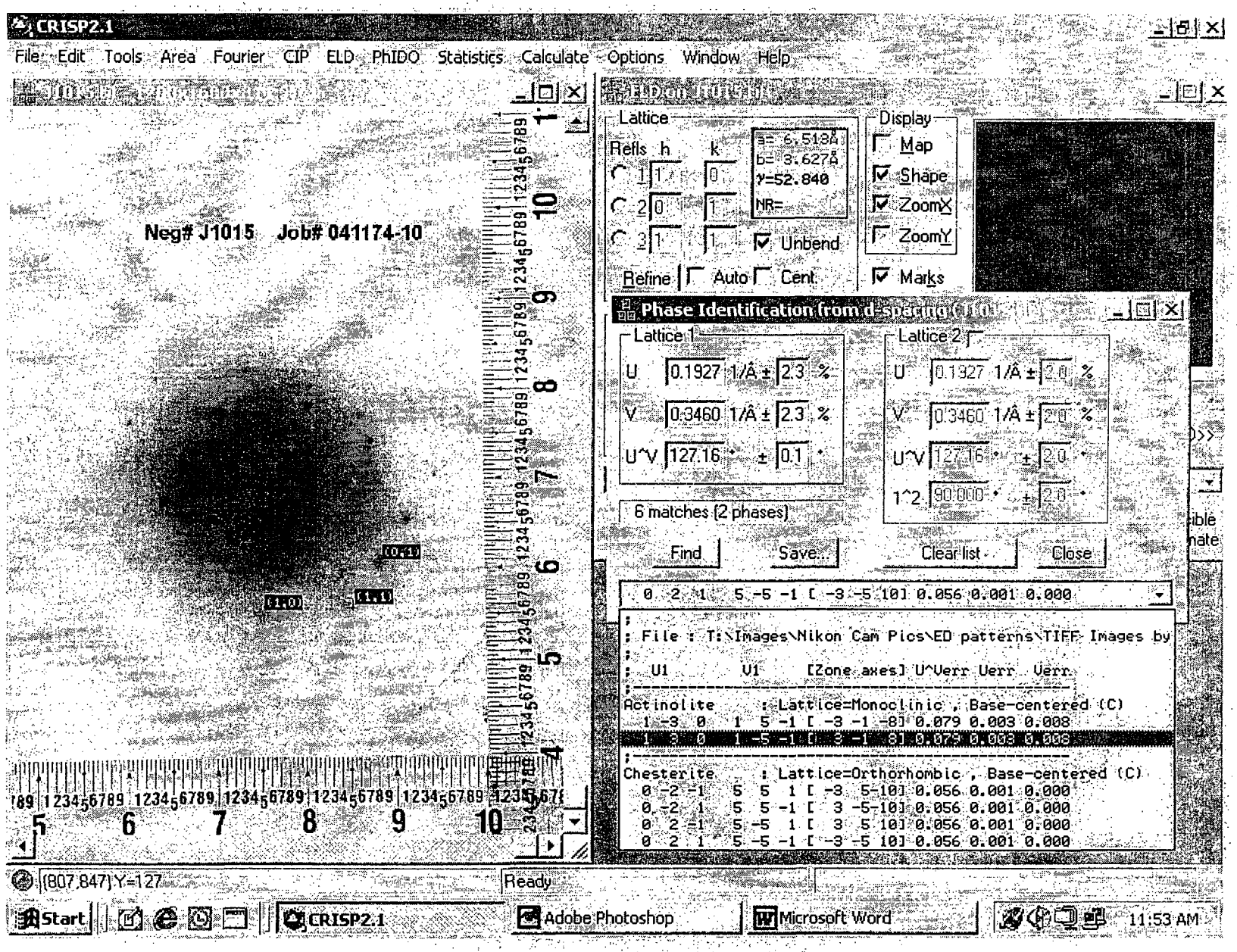
	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	59.33	Si+4	7.9274	7.9274							
Al2O3	1.168	Al+3	0.1839	0.0726	**0.1114**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	1.596	Fe+3	0.0016			0.0016	0.0000				
MgO	23.145	Mg+2	4.6104			4.6104	**0.0000**				
MnO	0	Fe+2	0.1765			0.1765	**0.0000**				
CaO	13.946	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0.318	Ca+2	1.9963					1.9963	0.0000		
K2O	0.497	Na+	0.0824					0.0037	**0.0787**	0.0787	0.0000
		K+	0.0847							0.0847	0.0000
Total	**100**		**Excess**	T site	**0.1114**	C site	**0.0000**	B site	**0.0786961**	A site	**0**
			Total	**8**		**4.8999**		**2.0000**		**0.1634**	**0.0000**
			%Fill	**100**		**97.9986**		**100**			

Prefix none
Name tremolite
Modifier none
Group Calcic Amphibole

Sample # **041174-02-15355**

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.16	Si > 7.5
Mg/(Mg+Fe2)	0.96	(Mg/(Mg+Fe2))>= 0.9
Si	7.93	

ACTINOLITE
[3 -1 8]



[illegible]

[illegible]

Element Net Counts

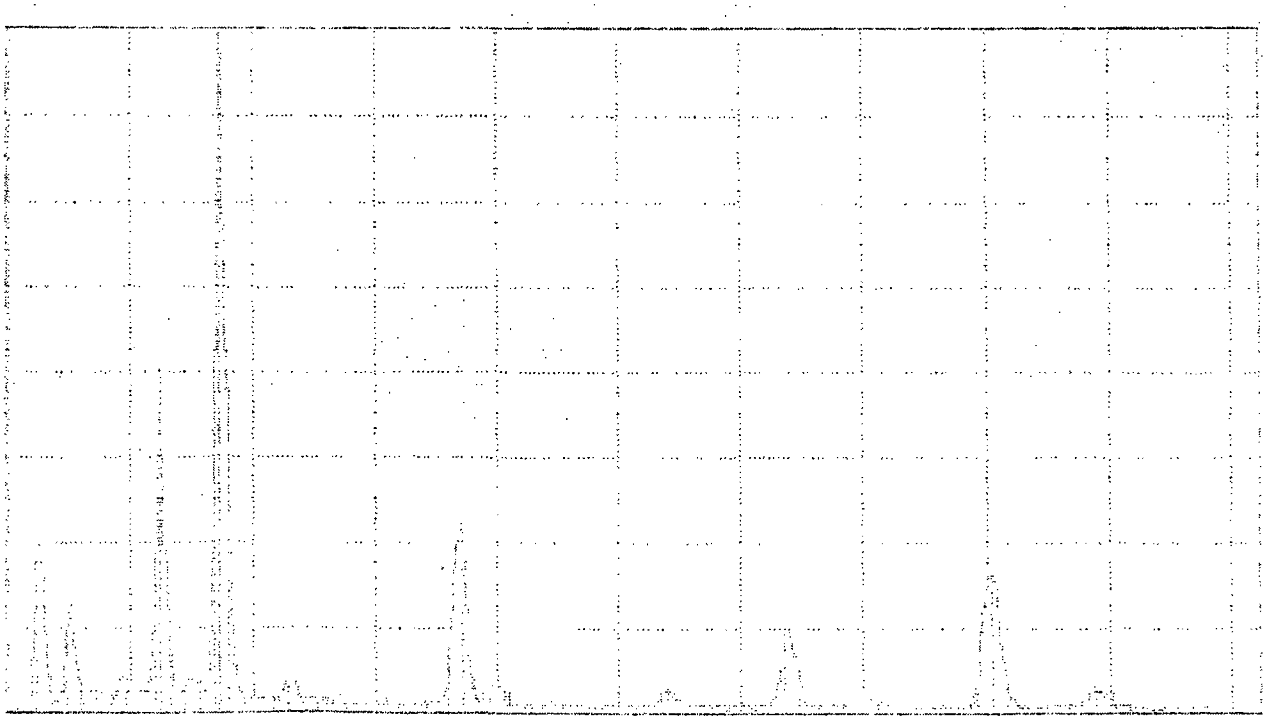
Element	Net Counts
Si-K	[illegible]
Mg-K	[illegible] 84
Al-K	[illegible] 48
K-K	[illegible] 20
Ca-K	[illegible] +/- [illegible]97
Fe-K	[illegible] 57
Na-K	0 +/- 0

[illegible]

[illegible]

ELEMENT	PEAK	K-FACTOR	CPL [illegible]	ATOM%	WT%	[illegible]	FORMULA
SI-K	[illegible]	1.000	1.000	21.[illegible]	27.[illegible]	[illegible]	SIO2
MG-K	[illegible]	1.000	0.162	9.[illegible]	[illegible].10	16.83	MGO
AL-K	[illegible]	[illegible]	0.018	[illegible]	[illegible]	0.[illegible]	AL2O3
K-K	41	[illegible]	0.00[illegible]	0.13	0.[illegible]	0.27	K2O
CA-K	[illegible]	[illegible]	0.042	5.14	[illegible]	[illegible]	CAO
FE-K	[illegible]	[illegible]	0.027	[illegible]	[illegible]	7.[illegible]	[illegible]
NA-K	0	[illegible]	0.000	0.00	0.00	0.00	NA2O
O			[illegible]	61.[illegible]	45.[illegible]		

[illegible]



[illegible]

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	59.6	Si+4	8.0000	8.0000							
Al2O3	0.93	Al+3	0.1659	0.0000	**0.1659**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	9.03	Fe+3	0.0194			0.0194	0.0000				
MgO	16.83	Mg+2	3.4758			3.4758	**0.0000**				
MnO	0	Fe+2	1.0461			1.0461	**0.0000**				
CaO	13.33	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0	Ca+2	1.9843					1.9843	0.0000		
K2O	0.27	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0643							0.0643	0.0000
Total	**99.99**		**Excess**	T site	**0.1659**	C site	**0.0000**	B site	**0**	A site	**0**
			Total	**8**		**4.7072**		**1.9843**		**0.0643**	**0.0000**
			%Fill	**100**		**94.1441**		**99.2155**			

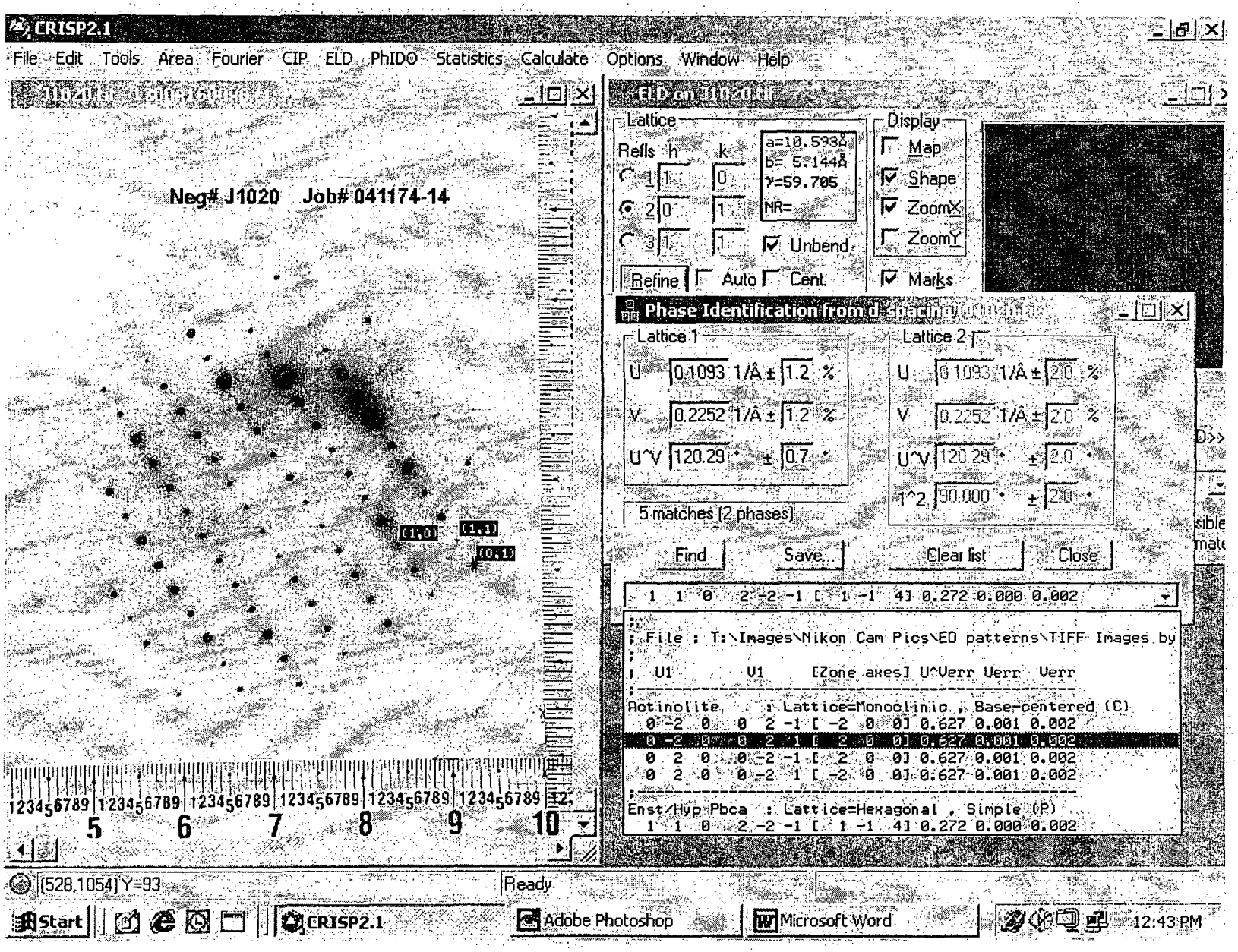
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # **041174-10-744**

Values		Satisfied Conditions
(Ca,Na)@B	1.98	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.98	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.06	Si > 7.5
Mg/(Mg+Fe2)	0.77	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[2 0 0]



[illegible]

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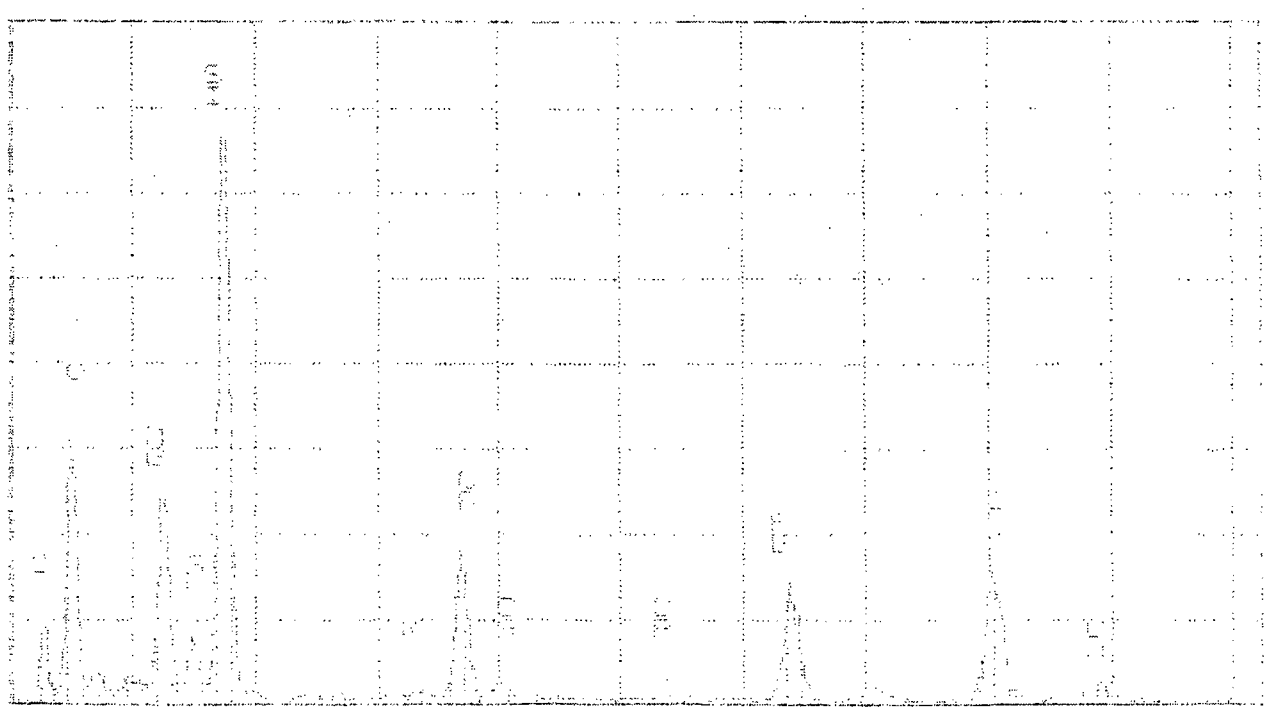
[illegible] University of Washington / [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible]



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.5	Si+4	7.6600	7.6600							
Al2O3	3.38	Al+3	0.5599	0.3400	**0.2199**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	14.95	Fe+3	0.4111			0.4111	0.0000				
MgO	14.73	Mg+2	3.0865			3.0865	**0.0000**				
MnO	0	Fe+2	1.3002			1.2826	**0.0176**				
CaO	10.82	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	1.36	Ca+2	1.6292					1.6292	0.0000		
K2O	0.25	Na+	0.3706					0.3532	**0.0174**	0.0174	0.0000
		K+	0.0448							0.0448	0.0000
Total	99.99		Excess	T site	0.2199	C site	0.0176	B site	0.0174033	A site	0
			Total	8		5.0000		1.9824		0.0622	0.0000
			%Fill	100		100		99.1201			

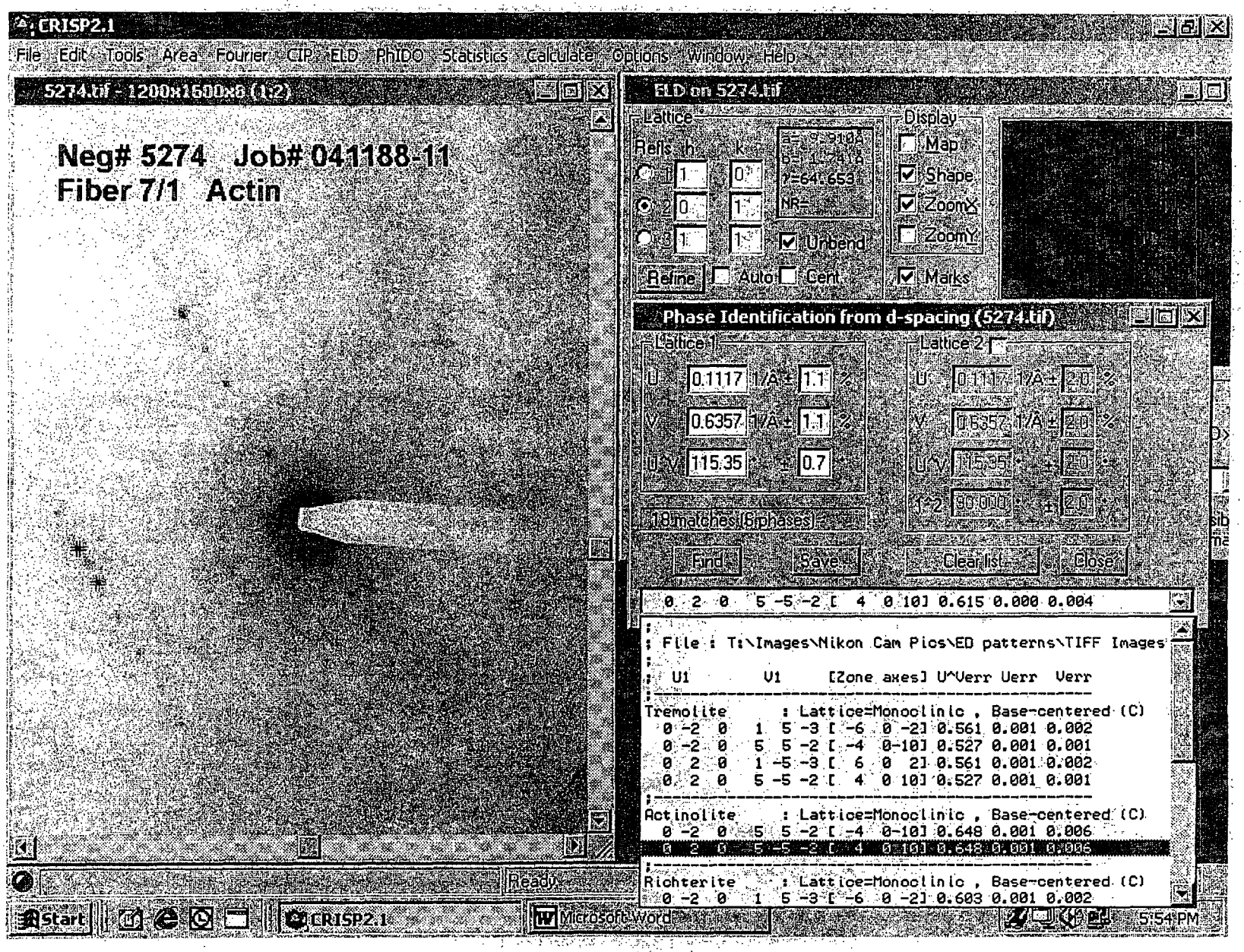
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041174-14-748

Values		Satisfied Conditions
(Ca,Na)@B	1.98	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.35	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.63	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.06	Si > 7.5
Mg/(Mg+Fe2)	0.70	(Mg/(Mg+Fe2))< 0.9
Si	7.66	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[205]

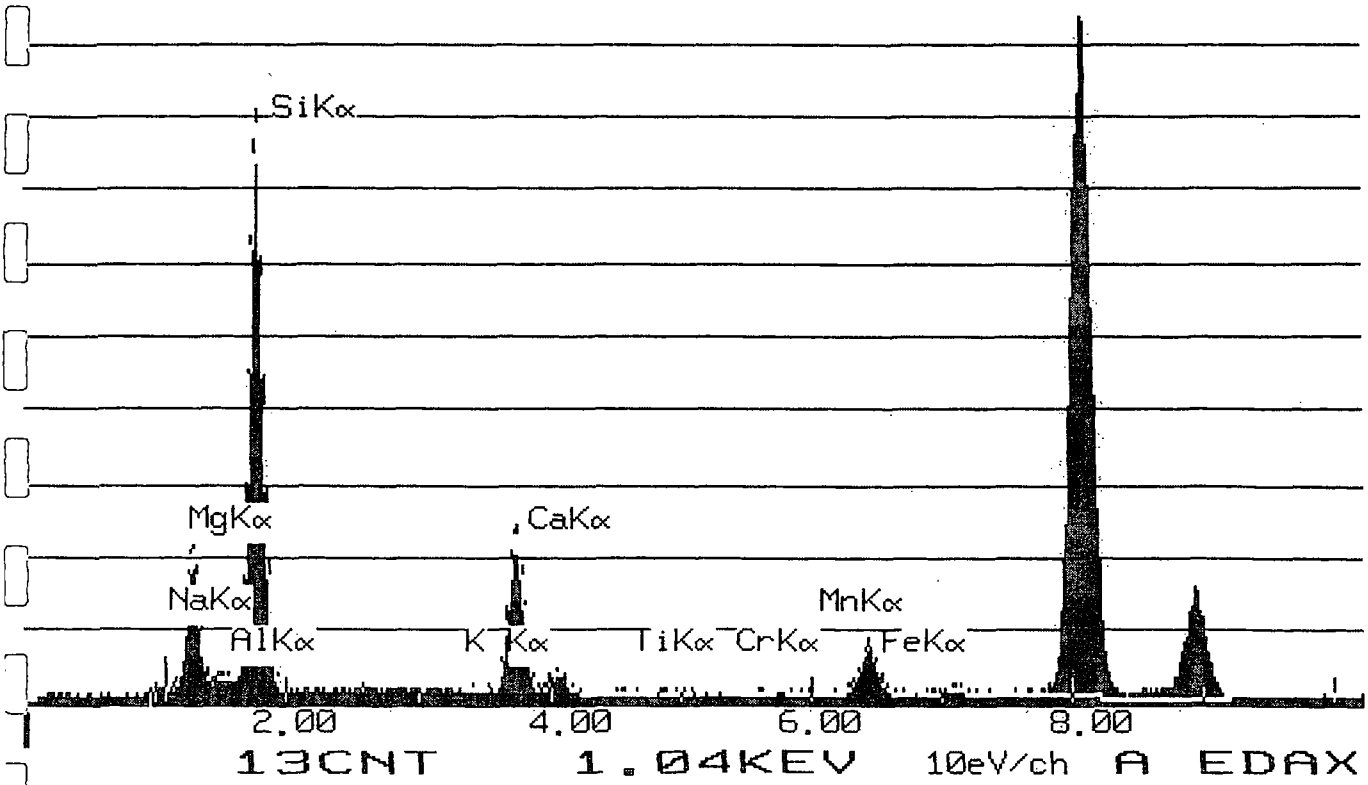


INTE-% :
LABEL = 041188-11 8/1 15194
14-OCT-72 05:13:28
99.152 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	28.108	11.718	19.429
ALK	2.652	0.664	1.255
SIK	122.045	28.615	61.217
K K	0.514	0.200	0.241
CAK	39.253	8.775	12.277
FEK	13.141	3.902	5.580
TOTAL			100.000

USED PEIF: USER

13-OCT-04 05:14:05 SUPER QUANT
RATE= 5375CPS TIME= 99LSEC
FS= 1424/ 1424 PRST= 200LSEC
A =041188-11 8/1 15194



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	61.217	Si+4	8.0000	8.0000							
Al2O3	1.255	Al+3	0.2183	0.0000	**0.2183**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	5.58	Fe+3	0.0185			0.0185	0.0000				
MgO	19.429	Mg+2	3.9330			3.9330	**0.0000**				
MnO	0	Fe+2	0.6476			0.6476	**0.0000**				
CaO	12.277	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0	Ca+2	1.7994					1.7994	0.0000		
K2O	0.241	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0630							0.0630	0.0000
Total	**99.999**		**Excess**	T site	**0.2183**	C site	**0.0000**	B site	**0**	A site	**0**
			Total	**8**		**4.8175**		**1.7994**		**0.0630**	**0.0000**
			%Fill	**100**		**96.3493**		**89.9694**			

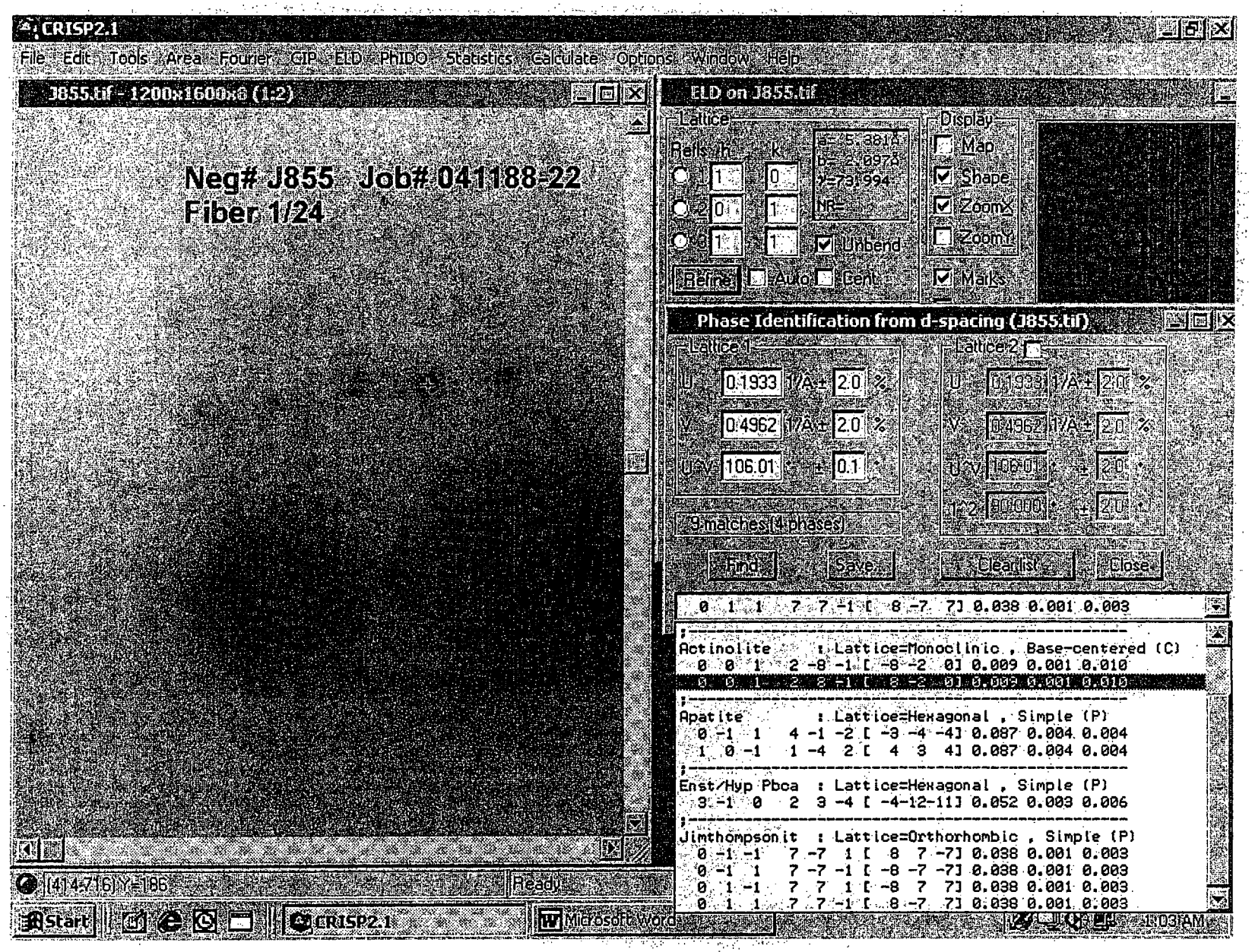
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # **041188-11-7-1**

Values		Satisfied Conditions
(Ca,Na)@B	1.80	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.80	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.06	Si > 7.5
Mg/(Mg+Fe2)	0.86	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[4-10]



SUMTF: QUANTIFY
Standardless Analysis

Refit _NAK' _NAK"
Refit _ALK' _ALK" _K K' _K K" _CAK" _NAK
Chi-sqrd = 2.84

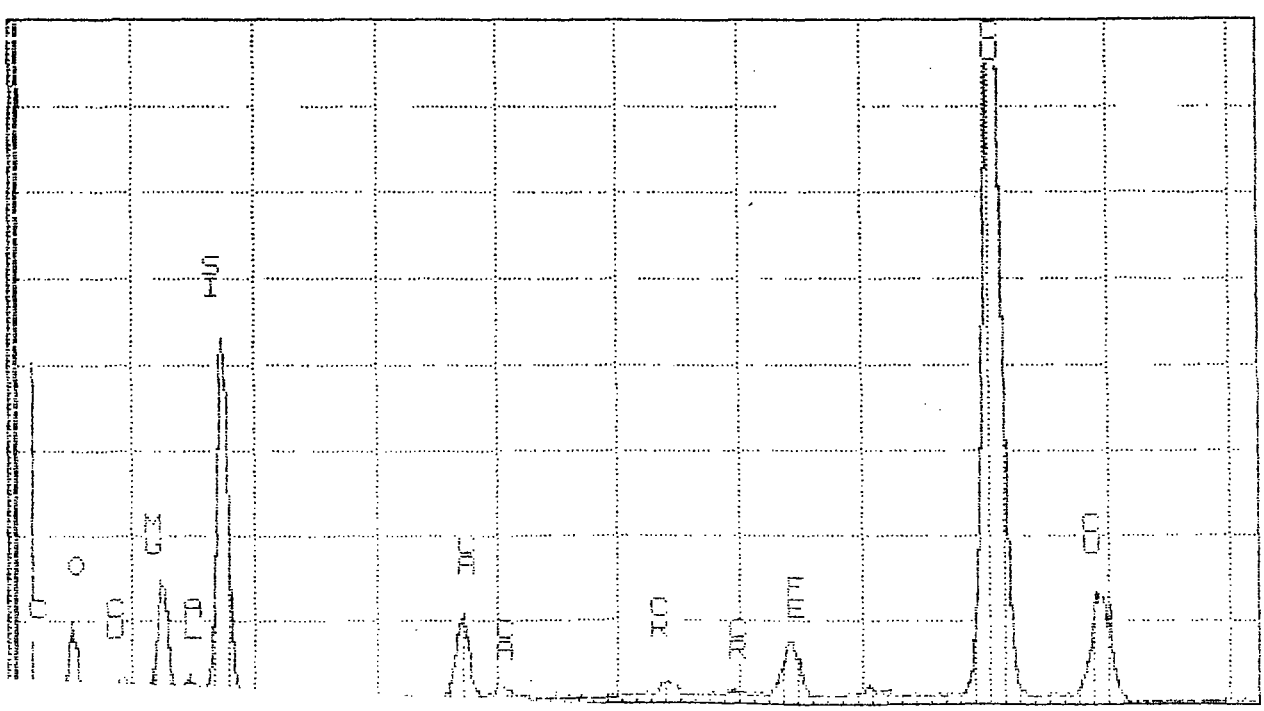
Element	Net Counts		
Si-K	5885	+/-	113
Mg-K	1892	+/-	87
Al-K	258	+/-	53
K -K	44	+/-	24
Ca-K	1980	+/-	55
Fe-K	1547	+/-	100
Na-K	0	+/-	0

NAK REF.S EDS:SIK EDS:MGK EDS:ALK EDS:K K EDS:CAK EDS:FEK

041188-22 11/24 SP591

EL-LINE	PEAK	K-FACTOR	CEL/CREF	ATOM%	EL Wt%	WT%	FORMULA
SI-K	5885	1.000	1.000	20.19	25.88	55.45	SIO2
MG-K	1892	1.129	0.363	8.56	9.40	15.67	MGO
AL-K	258	1.030	0.072	1.50	1.86	3.50	AL2O3
K-K	44	1.060	0.008	0.12	0.21	0.25	K2O
CA-K	1980	1.033	0.348	4.92	9.00	12.60	CAO
FE-K	1547	1.287	0.339	3.42	8.76	12.51	FE2O3
NA-K	0	2.479	0.000	0.01	0.01	0.01	NA2O3
O			1.735	61.30	44.89		

TN-5500 University of Washington / JEOL FRI 15-OCT-04 20:49
Cursor: 0.070keV = 0



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	55.45	Si+4	7.7355	7.7355							
Al2O3	3.5	Al+3	0.5754	0.2645	**0.3109**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.51	Fe+3	0.1051			0.1051	0.0000				
MgO	15.67	Mg+2	3.2590			3.2590	**0.0000**				
MnO	0	Fe+2	1.3426			1.3250	**0.0175**				
CaO	12.6	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0.01	Ca+2	1.8831					1.8831	0.0000		
K2O	0.25	Na+	0.0027					0.0027	**0.0000**	0.0000	0.0000
		K+	0.0445							0.0445	0.0000
Total	**99.99**		**Excess**	T site	**0.3109**	C site	**0.0175**	B site	**0**	A site	**0**
			Total	**8**		**5.0000**		**1.8858**		**0.0445**	**0.0000**
			%Fill	**100**		**100**		**94.2916**			

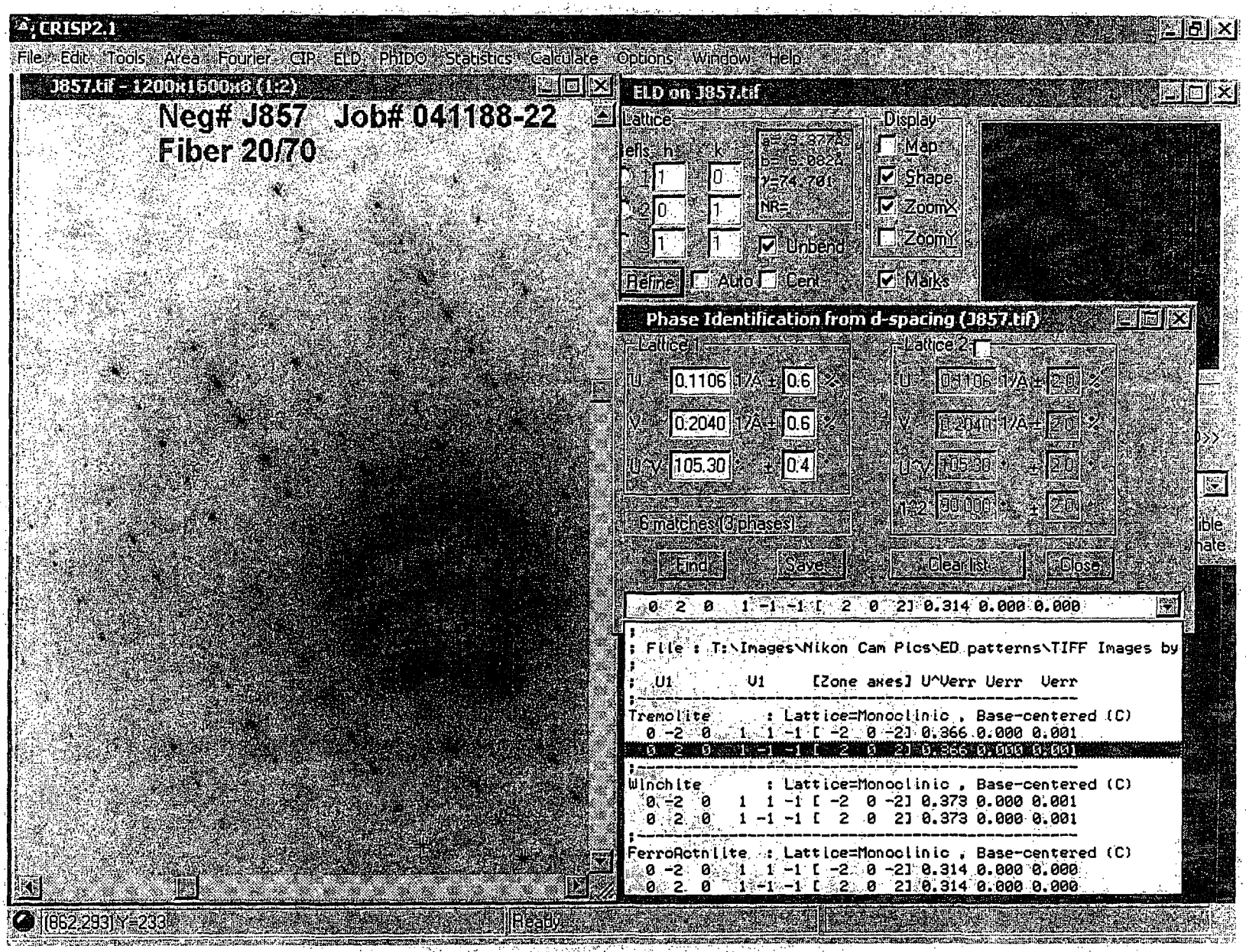
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # **041188-22-11-24**

Values		Satisfied Conditions
(Ca,Na)@B	1.89	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.88	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.04	Si > 7.5
Mg/(Mg+Fe2)	0.71	(Mg/(Mg+Fe2))< 0.9
Si	7.74	

Mineral Analysis Program (Version 5.0)

TREMOLITE
[101]



Refit _ALK' _ALK" _NAK' _NAK"
Refit _K K' _K K" _FEK" _NAK
Chi-sqd = 2.70

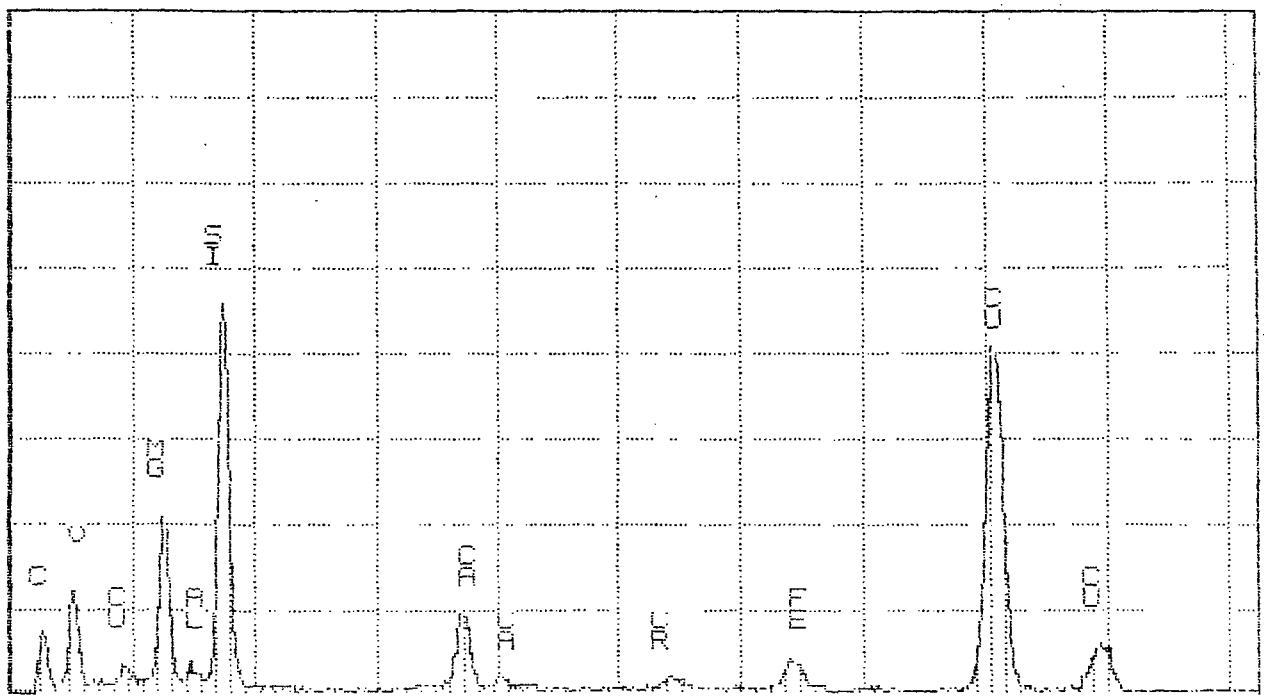
Element	Net Counts		
Si-K	6321	+/-	117
Mg-K	2647	+/-	95
Al-K	332	+/-	55
K -K	41	+/-	24
Ca-K	1744	+/-	89
Fe-K	752	+/-	47
Na-K	0	+/-	0

REF.S EDS:SIK EDS:MGK EDS:ALK EDS:K K EDS:CAK EDS:FEK
EDS:NAK

041188-22 20/70

EL-LINE	PEAK	K-FACTOR	CEL/CREF	ATOM%	H WT%	WT%	FORMULA
SI-K	6321	1.000	1.000	20.30	26.88	57.59	SIO2
MG-K	2647	1.129	0.473	11.21	12.72	21.20	MGO
AL-K	332	1.040	0.088	1.81	2.31	4.35	AL2O3
K-K	41	1.060	0.007	0.10	0.19	0.23	K2O
CA-K	1744	1.033	0.285	4.05	7.66	10.73	CAO
FE-K	752	1.287	0.153	1.56	4.12	5.88	FE2O3
NA-K	0	2.479	0.000	0.00	0.01	0.01	NA2O
O			1.716	60.97	46.12		

TN-5500 University of Washington / JEOL FRI 15-OCT-04 22:23
Cursor: 0.004keV = 0



0 000 VFS = 1024 10.240

53 041188-22 20/70 SP593

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	57.59	Si+4	7.7061	7.7061							
Al2O3	4.35	Al+3	0.6860	0.2939	**0.3921**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	5.88	Fe+3	0.2901			0.2901	0.0000				
MgO	21.2	Mg+2	4.2291			4.2291	**0.0000**				
MnO	0	Fe+2	0.3355			0.0888	**0.2468**				
CaO	10.73	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0.01	Ca+2	1.5382					1.5382	0.0000		
K2O	0.23	Na+	0.0026					0.0026	**0.0000**	0.0000	0.0000
		K+	0.0393							0.0393	0.0000
Total	**99.99**		**Excess**	T site	**0.3921**	C site	**0.2468**	B site	**0**	A site	**0**
			Total	**8**		**5.0000**		**1.5408**		**0.0393**	**0.0000**
			%Fill	**100**		**100**		**77.0389**			

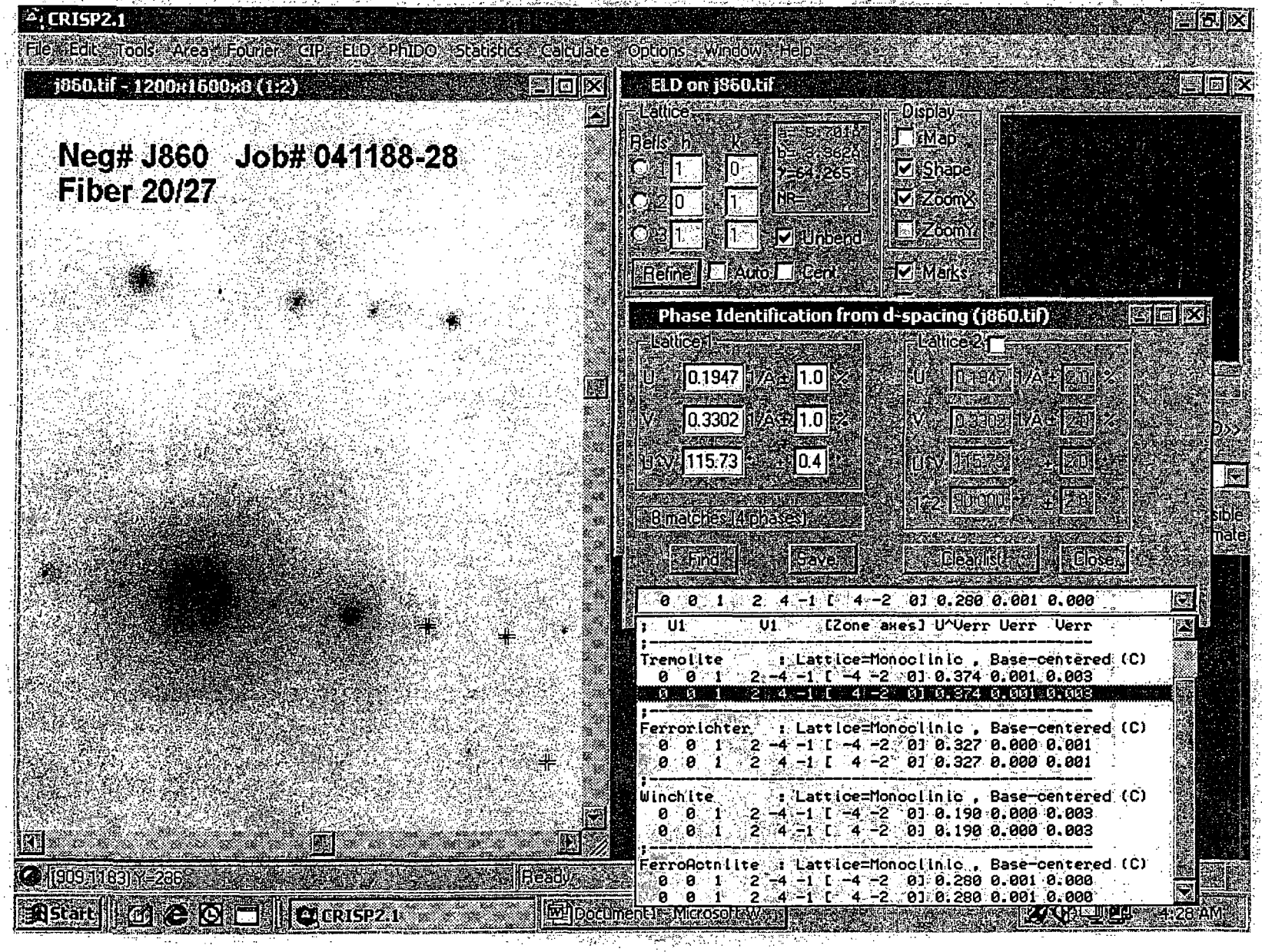
Prefix none
Name tremolite
Modifier none
Group Calcic Amphibole

Sample # **041188-22-20-70**

Values		Satisfied Conditions
(Ca,Na)@B	1.54	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.54	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.04	Si > 7.5
Mg/(Mg+Fe2)	0.93	(Mg/(Mg+Fe2))>= 0.9
Si	7.71	

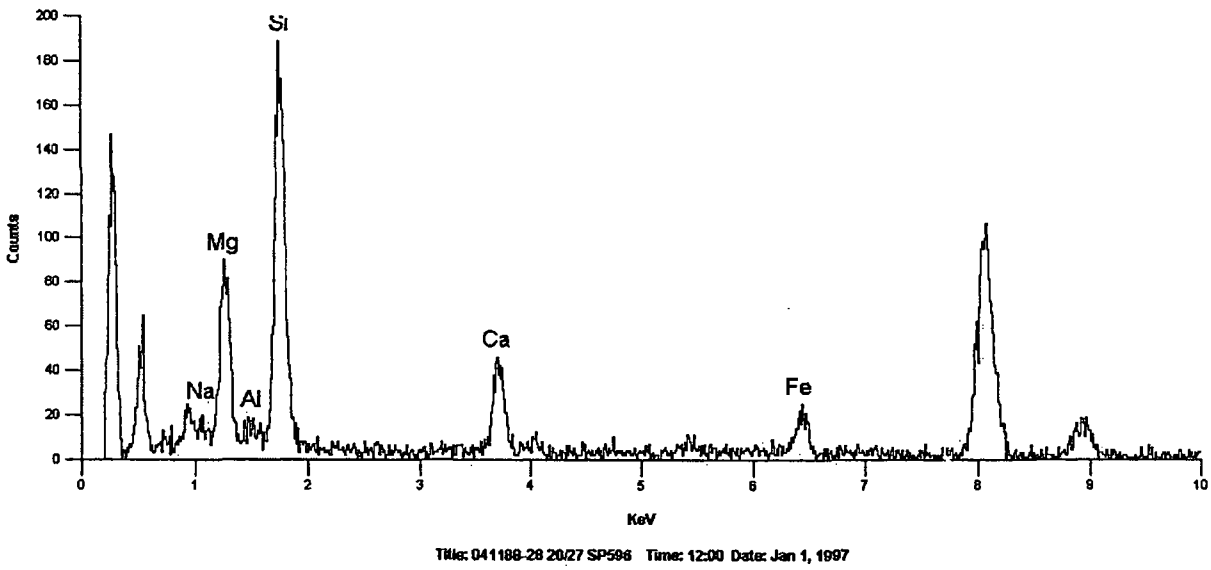
Mineral Analysis Program (Version 5.0)

TREMOLITE
[2 -1 0]



Quantitative Analysis Results - Standardless Analysis :
Spectrum2 041188-28 20/27 SP596 Jan 1, 1997
EDS Parameters - 18KV, Takeoff Angle: 28.2°, Fit Index: 809.25
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	9.83	MgO	18.72	1.33	18.72
Al	1.64	Al2O3	3.96	1.43	3.96
Si	21.42	SiO2	60.80	2.80	60.80
Ca	4.16	CaO	11.03	1.21	11.03
Fe	1.46	Fe2O3	5.50	1.11	5.50
<Total>	100.00		100.00		100.00



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	60.8	Si+4	8.0000	8.0000							
Al2O3	3.96	Al+3	0.6299	0.0000	0.6299						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	5.5	Fe+3	0.0446			0.0446	0.0000				
MgO	18.72	Mg+2	3.7338			3.7338	0.0000				
MnO	0	Fe+2	0.5821			0.5821	0.0000				
CaO	11.03	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.5881					1.5881	0.0000		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100.01		Excess	T site	0.6299	C site	0.0000	B site	0	A site	0
			Total	8		4.9906		1.5881		0.0000	0.0000
			%Fill	100		99.8111		79.4072			

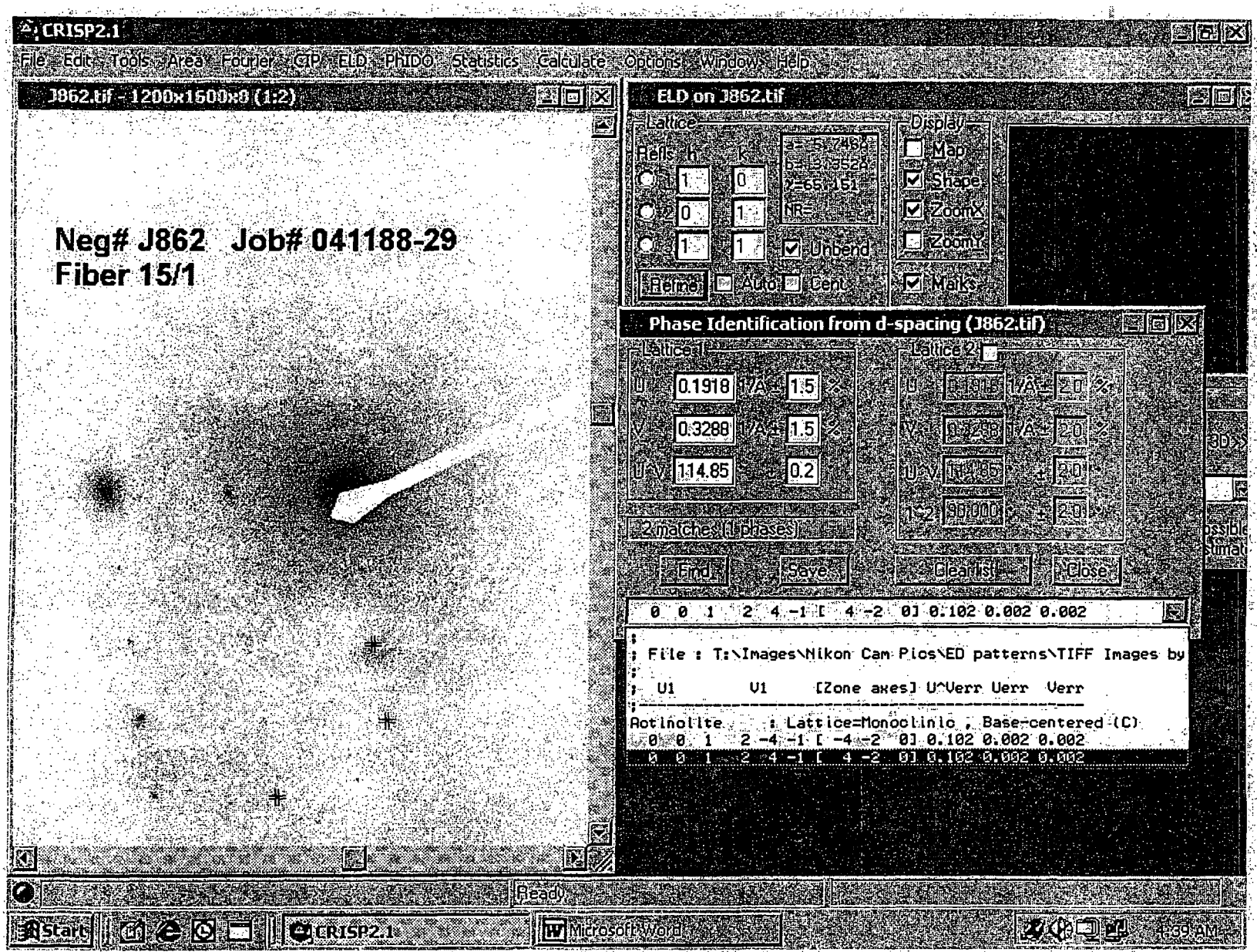
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041188-28-20-27

Values		Satisfied Conditions
(Ca,Na)@B	1.59	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.59	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.87	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[2-10]



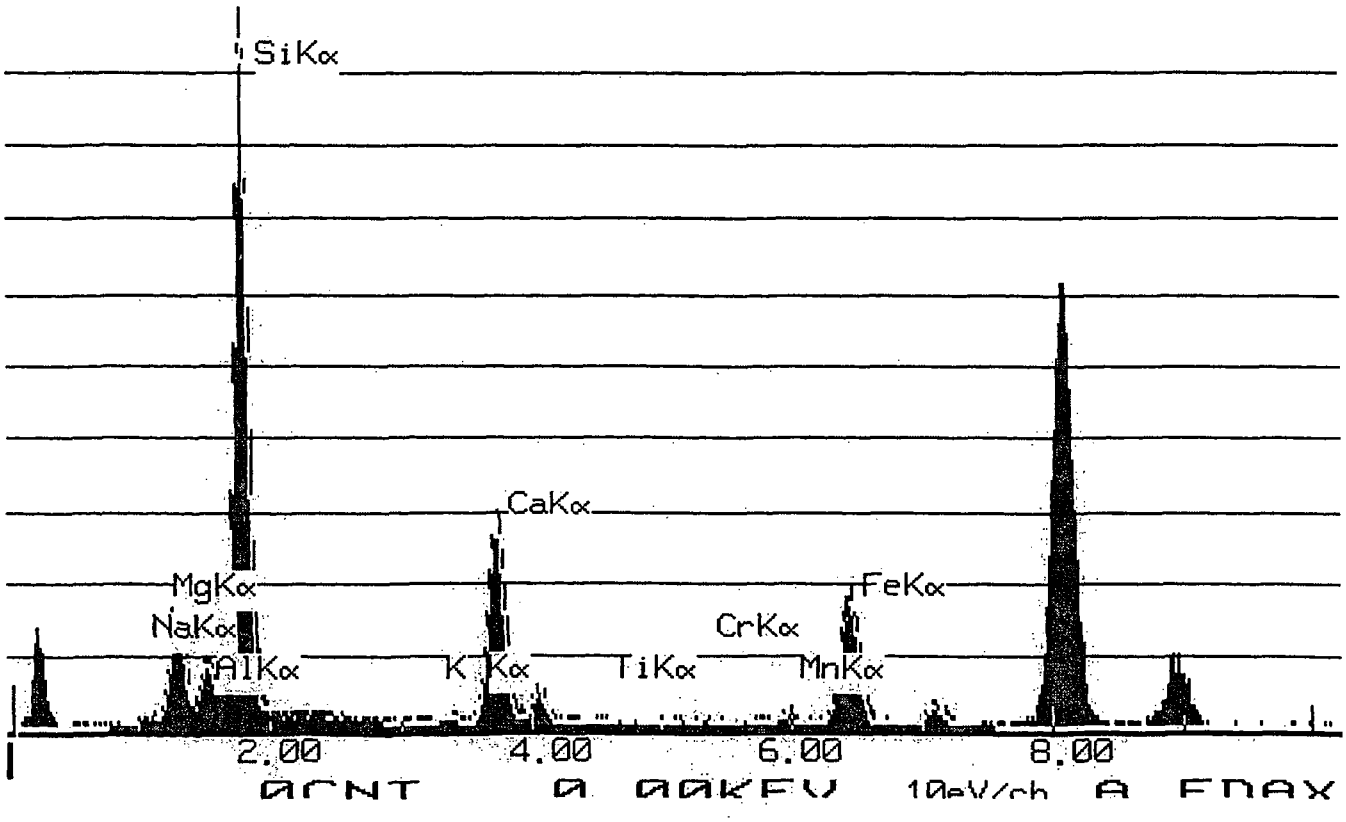
INTE-% :
LABEL = 041188-29 15/1 15228
23-NOV-72 20:36:40
165.691 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	10.846	8.468	14.041
ALK	4.219	1.979	3.739
SIK	60.372	26.511	56.716
K K	0.640	0.467	0.562
CAK	20.912	8.755	12.251
TIK	0.368	0.217	0.363
CRK	0.187	0.109	0.159
MNK	0.688	0.416	0.537
FEK	14.630	8.137	11.633

TOTAL			100.000

USED PEIF: USER

22-NOV-04 20:37:04 SUPER QUANT
RATE= 11CPS TIME= 165LSEC
FS= 1019/ 1019 PRST= 200LSEC
A =041188-29 15/1 15228



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	56.716	Si+4	7.8864	7.8864							
Al2O3	3.739	Al+3	0.6127	0.1136	**0.4991**						
TiO2	0.363	Ti+4	0.0380	0.0000	**0.0380**						
Cr2O3	0.159	Cr+3	0.0175			0.0175	0.0000				
Fe(total)O	11.632	Fe+3	0.0122			0.0122	0.0000				
MgO	14.041	Mg+2	2.9107			2.9107	**0.0000**				
MnO	0.537	Fe+2	1.3390			1.3390	**0.0000**				
CaO	12.251	Mn+2	0.0632			0.0632	**0.0000**				
Na2O	0	Ca+2	1.8250					1.8250	0.0000		
K2O	0.562	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0997							0.0997	0.0000
Total	100		Excess	T site	**0.5371**	C site	**0.0000**	B site	**0**	A site	**0**
			Total	8		4.8796		1.8250		0.0997	0.0000
			%Fill	100		97.5921		91.2507			

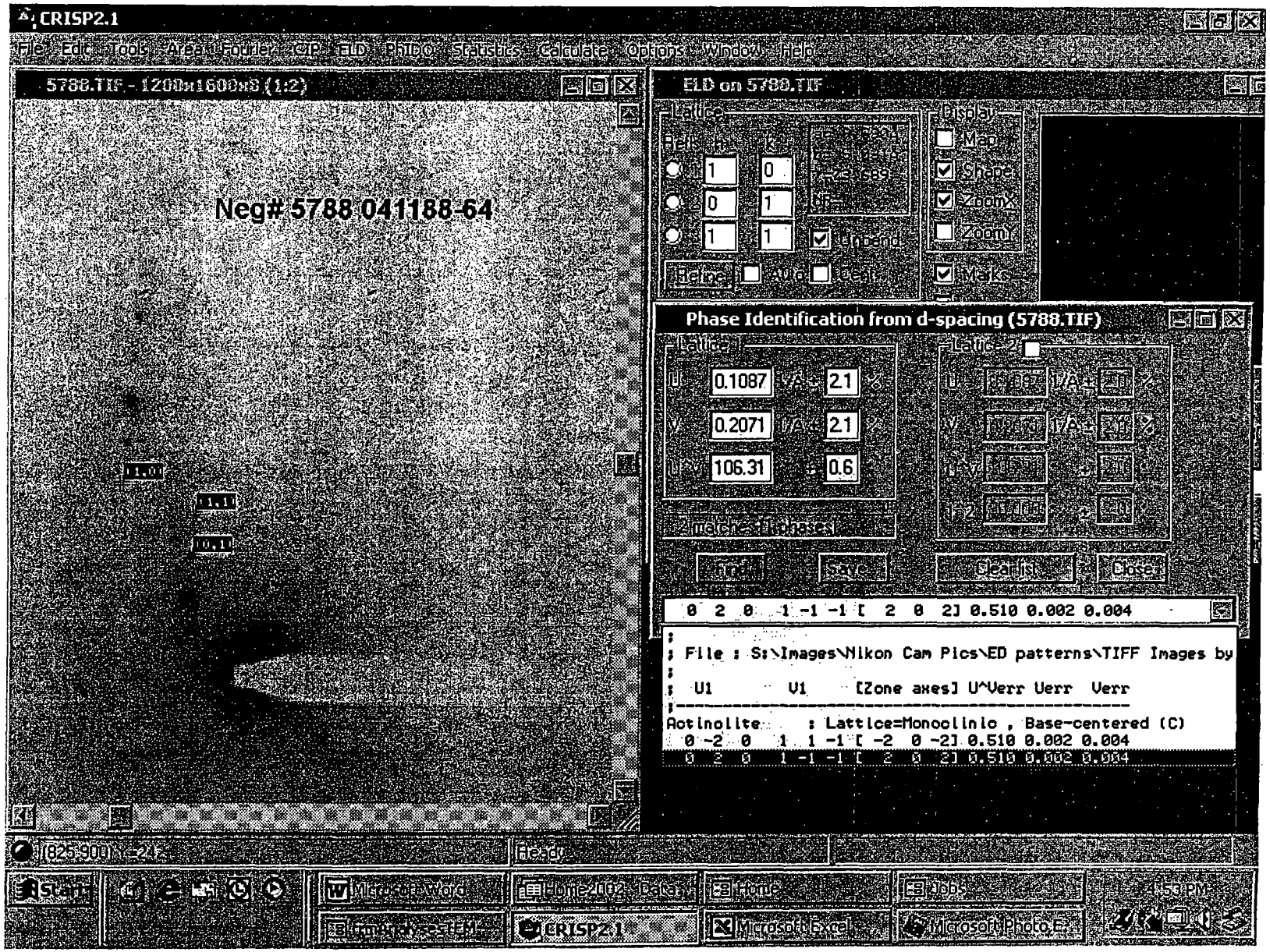
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041188-29-15228

Values		Satisfied Conditions
(Ca,Na)@B	1.83	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.83	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.10	Si > 7.5
Mg/(Mg+Fe2)	0.68	(Mg/(Mg+Fe2))< 0.9
Si	7.89	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
041188-64 Neg#5788
[1 0 1]



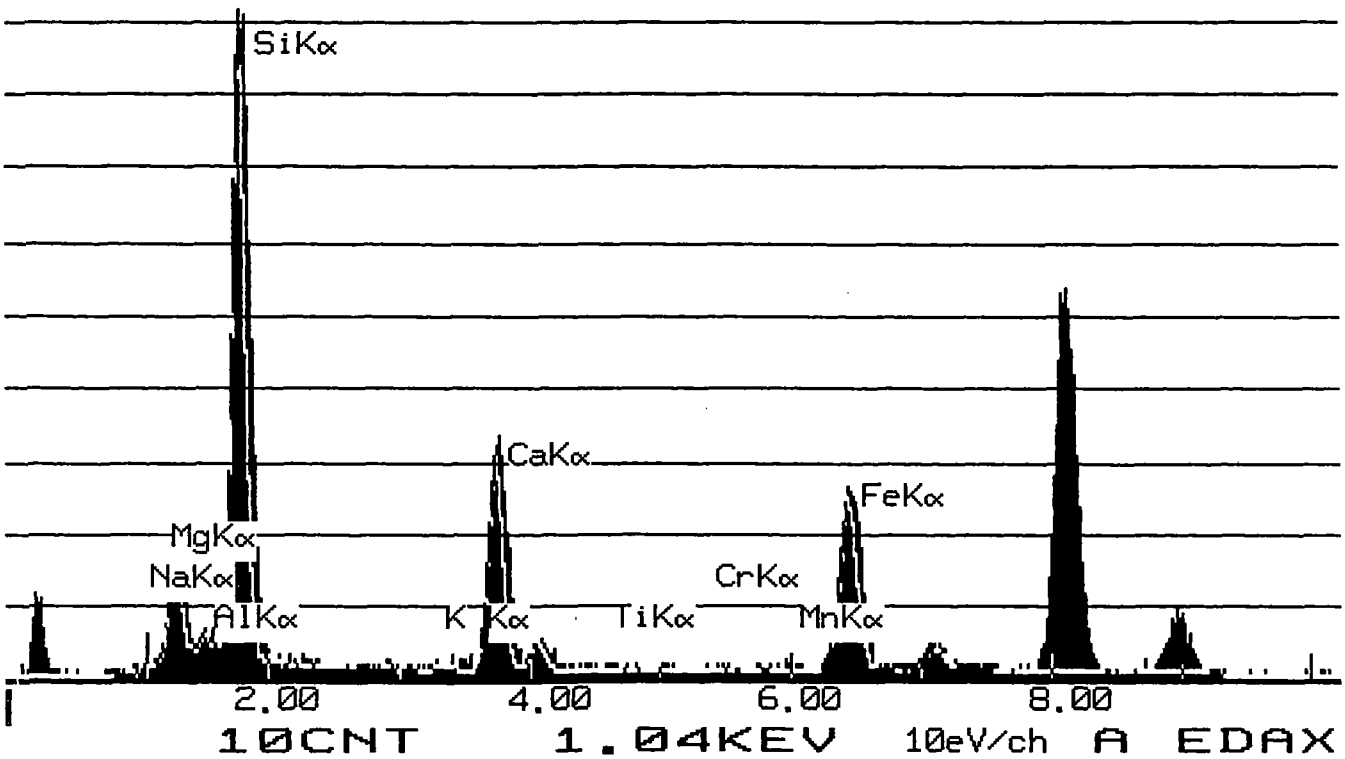
INTE-% :
LABEL = 041188-64 SP 15631
02-JAN-73 11:09:54
73.533 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	21.582	7.770	12.883
ALK	2.570	0.556	1.050
SIK	126.637	25.641	54.856
K K	1.319	0.444	0.535
CAK	49.773	9.609	13.444
TIK	0.707	0.193	0.321
MNK	0.449	0.125	0.161
FEK	45.680	11.715	16.749

TOTAL			100.000

USED PEIF: USER

01-JAN-05 11:10:28 SUPER QUANT
RATE= 13CPS TIME= 74LSEC
FS= 1048/ 1048 PRST=9999LSEC
A =041188-64 SP 15631



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.856	Si+4	7.8761	7.8761							
Al2O3	1.05	Al+3	0.1777	0.1239	**0.0538**						
TiO2	0.321	Ti+4	0.0347	0.0000	**0.0347**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	16.749	Fe+3	0.0181			0.0181	0.0000				
MgO	12.883	Mg+2	2.7576			2.7576	**0.0000**				
MnO	0.161	Fe+2	1.9907			1.9907	**0.0000**				
CaO	13.444	Mn+2	0.0196			0.0196	**0.0000**				
Na2O	0	Ca+2	2.0679					2.0000	0.0679		
K2O	0.535	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0980							0.0980	0.0000
Total	**99.999**		**Excess**	T site	**0.0884**	C site	**0.0000**	B site	**0.0679377**	A site	**0**
			Total	**8**		**4.8744**		**2.0000**		**0.0980**	**0.0000**
			%Fill	**100**		**97.4885**		**100**			

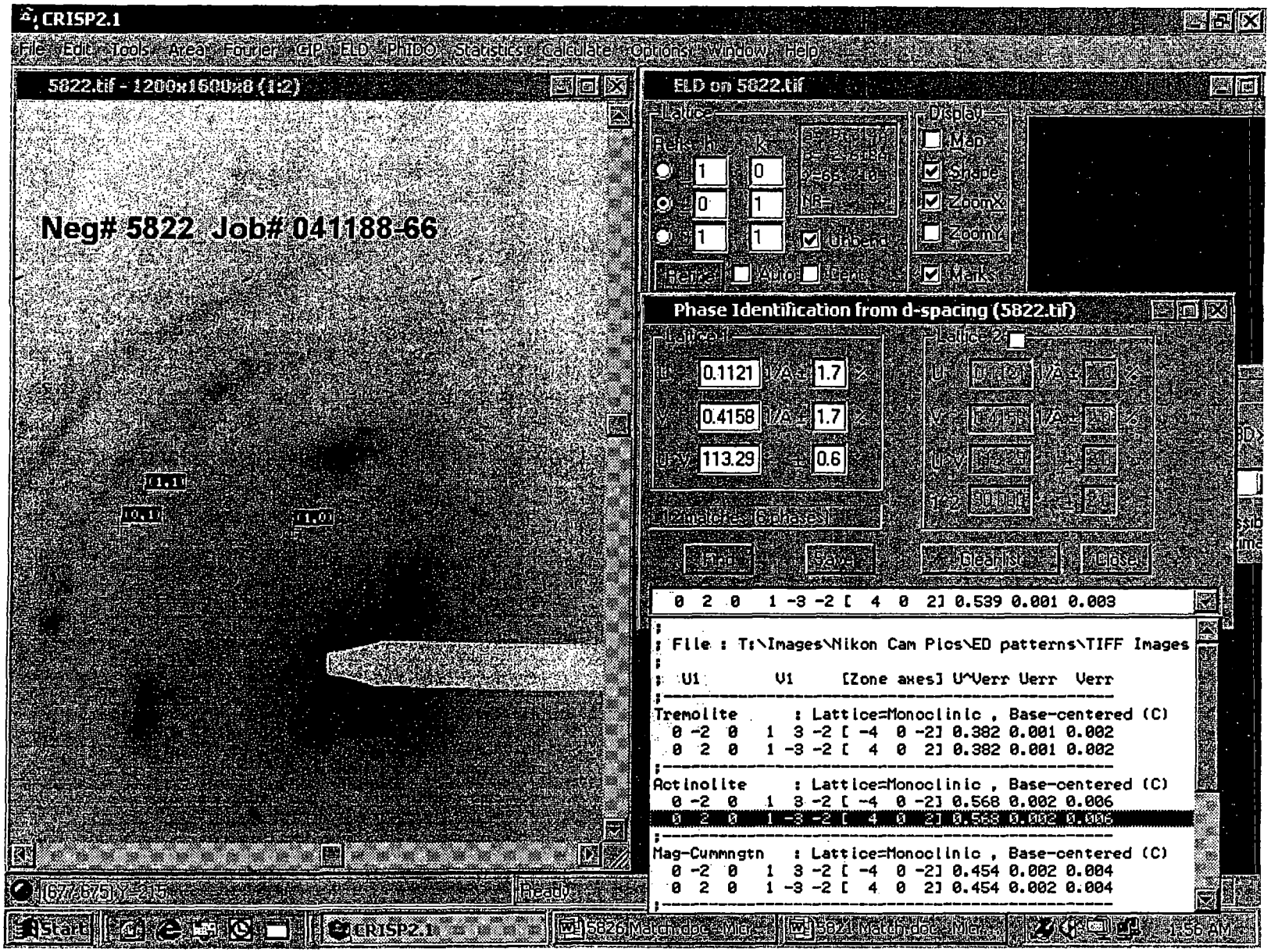
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # 041188-64-15631

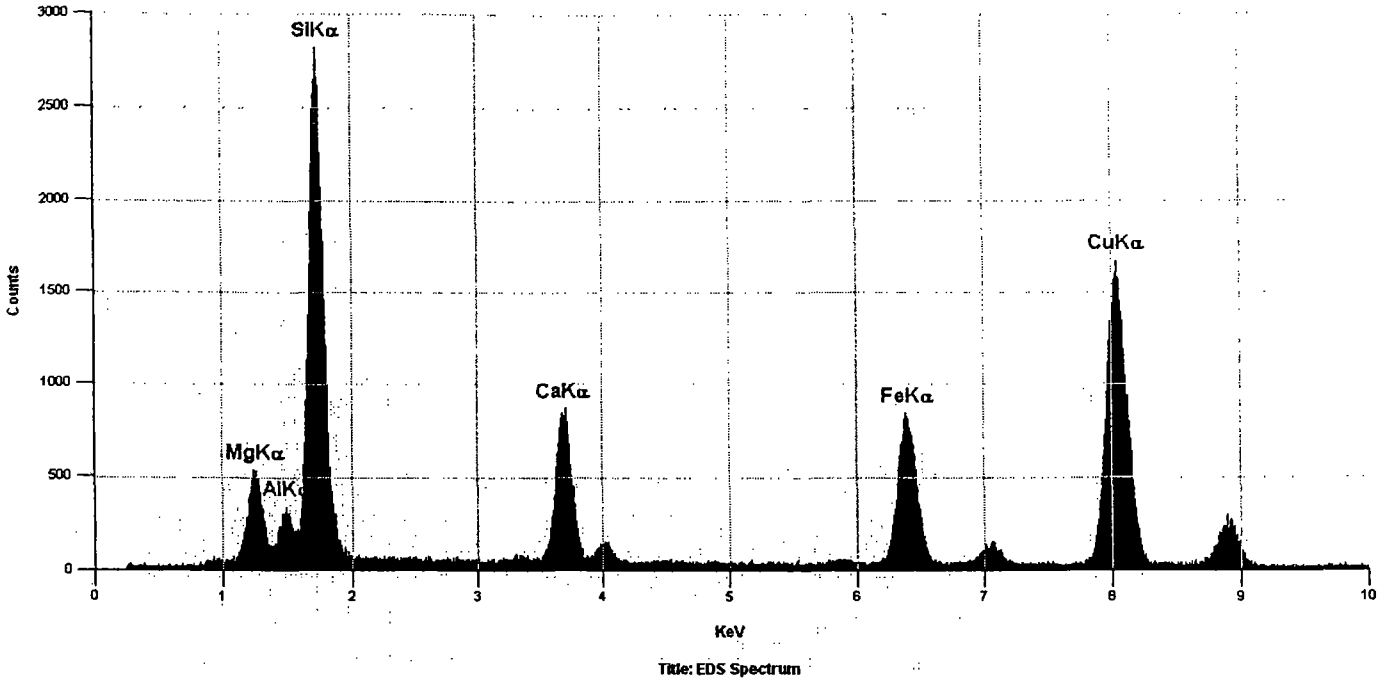
Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.10	Si > 7.5
Mg/(Mg+Fe2)	0.58	(Mg/(Mg+Fe2))< 0.9
Si	7.88	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
Zone Axis [2 0 1]
JEOL 1200
041188-66 Neg#5822



WINEDS



Quantitative Analysis Results - Standardless Analysis :
041188-66 SP 15674 Thu, Jan 13 2005
EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 9.16
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	6.67	MgO	12.05	0.41	12.05
Al	0.82	Al2O3	1.87	0.12	1.87
Si	20.97	SiO2	56.49	0.74	56.49
Ca	4.28	CaO	10.77	0.29	10.77
Fe	5.25	Fe2O3	18.81	0.55	18.81
<Total>	100.00		100.00		100.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	56.49	Si+4	7.9870	7.9870							
Al2O3	1.87	Al+3	0.3116	0.0130	**0.2986**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	18.81	Fe+3	0.4202			0.4202	0.0000				
MgO	12.05	Mg+2	2.5400			2.5400	**0.0000**				
MnO	0	Fe+2	1.7568			1.7412	**0.0157**				
CaO	10.77	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0	Ca+2	1.6314					1.6314	0.0000		
K2O	0	Na+	0.0000					0.0000	**0.0000**	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	**99.99**		**Excess**	T site	**0.2986**	C site	**0.0157**	B site	**0**	A site	**0**
			Total	**8**		**5.0000**		**1.6314**		**0.0000**	**0.0000**
			%Fill	**100**		**100**		**81.5684**			

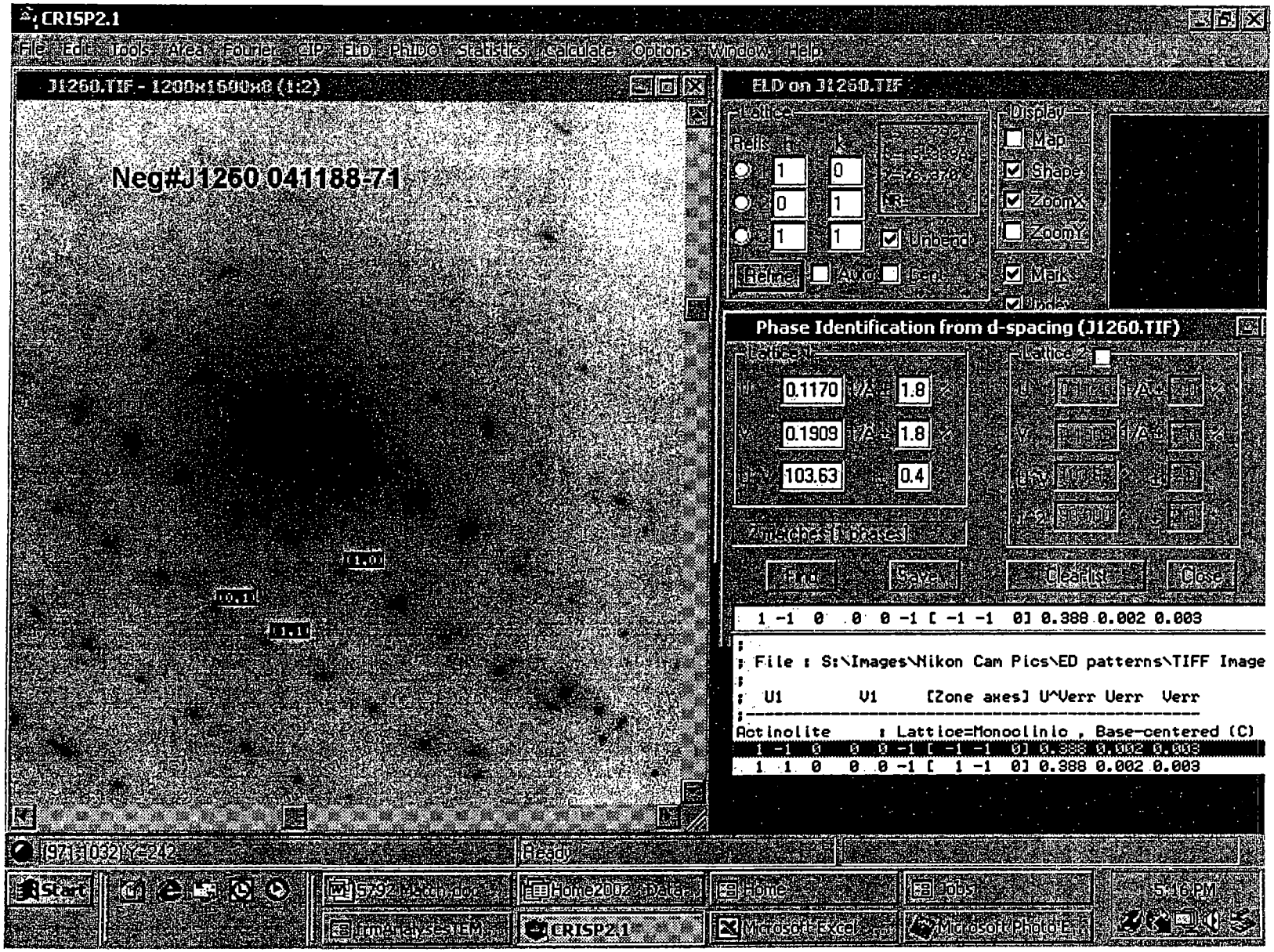
Prefix none
Name **actinolite**
Modifier none
Group **Calcic Amphibole**

Sample # **041188-66-15674**

Values		Satisfied Conditions
(Ca,Na)@B	1.63	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.63	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.59	(Mg/(Mg+Fe2))< 0.9
Si	7.99	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
041188-71 Neg#J1260
[-1 -1 0]



*X 'SDMTF'
SWMTF -XB/60

SWMTF: QUANTIFY
Standardless Analysis

Chi-sqd = 6.17

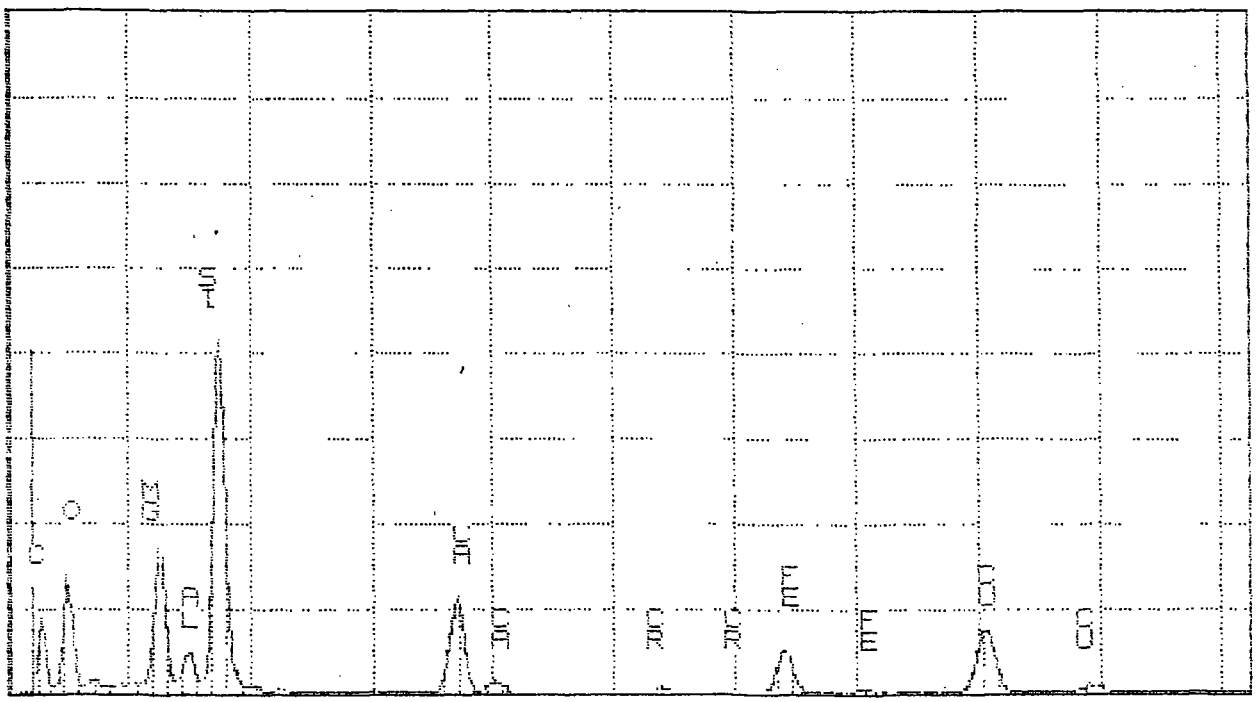
Si-K	23700 +/-	306
Mg-K	8953 +/-	293
Al-K	2296 +/-	367
Ca-K	8140 +/-	172
Fe-K	4541 +/-	137
Na-K	388 +/-	141
K -K	112 +/-	85

REF.S EDS:STK EDS:MGK EDS:ALK EDS:CAK EDS:FEK EDS:NAK
EDS:K K

041188-/1 SP937

EL-LINE	PEAK	K-FACTOR	CFL/CREF	ATOM%	EL WT%	WT%	FORMULA
SI-K	23700	1.000	1.000	20.43	26.49	56.77	SIO2
MG-K	8953	1.000	0.378	9.00	10.01	16.68	MGO
AL-K	2296	0.750	0.073	1.54	1.93	3.64	AL2O3
CA-K	8140	0.949	0.092	4.67	8.65	12.10	CAO
FE-K	4541	1.399	0.268	2.74	7.11	10.15	FE2O3
NA-K	388	0.549	0.004	0.72	0.24	0.49	NA2O3
K-K	112	1.054	0.005	0.07	0.13	0.16	K2O
O			1.715	61.32	45.45		

TN-5500 University of Washington / JEOL MON 03-JAN-05 14:18
Cursor: 0.000keV = 0 ROI (0) 0.000: 0.000



A 000 B- 5 VFS = 4096 10.240
35 041188-71 SP937

1,30

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	56.77	Si+4	7.8206	7.8206							
Al2O3	3.64	Al+3	0.5910	0.1794	**0.4115**						
TiO2	0	Ti+4	0.0000	0.0000	**0.0000**						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	10.15	Fe+3	0.0316			0.0316	0.0000				
MgO	16.68	Mg+2	3.4256			3.4256	**0.0000**				
MnO	0	Fe+2	1.1341			1.1313	**0.0029**				
CaO	12.1	Mn+2	0.0000			0.0000	**0.0000**				
Na2O	0.49	Ca+2	1.7858					1.7858	0.0000		
K2O	0.16	Na+	0.1309					0.1309	**0.0000**	0.0000	0.0000
		K+	0.0281							0.0281	0.0000
Total	**99.99**		**Excess**	T site	**0.4115**	C site	**0.0029**	B site	**0**	A site	**0**
			Total	**8**		**5.0000**		**1.9166**		**0.0281**	**0.0000**
			%Fill	**100**		**100**		**95.8323**			

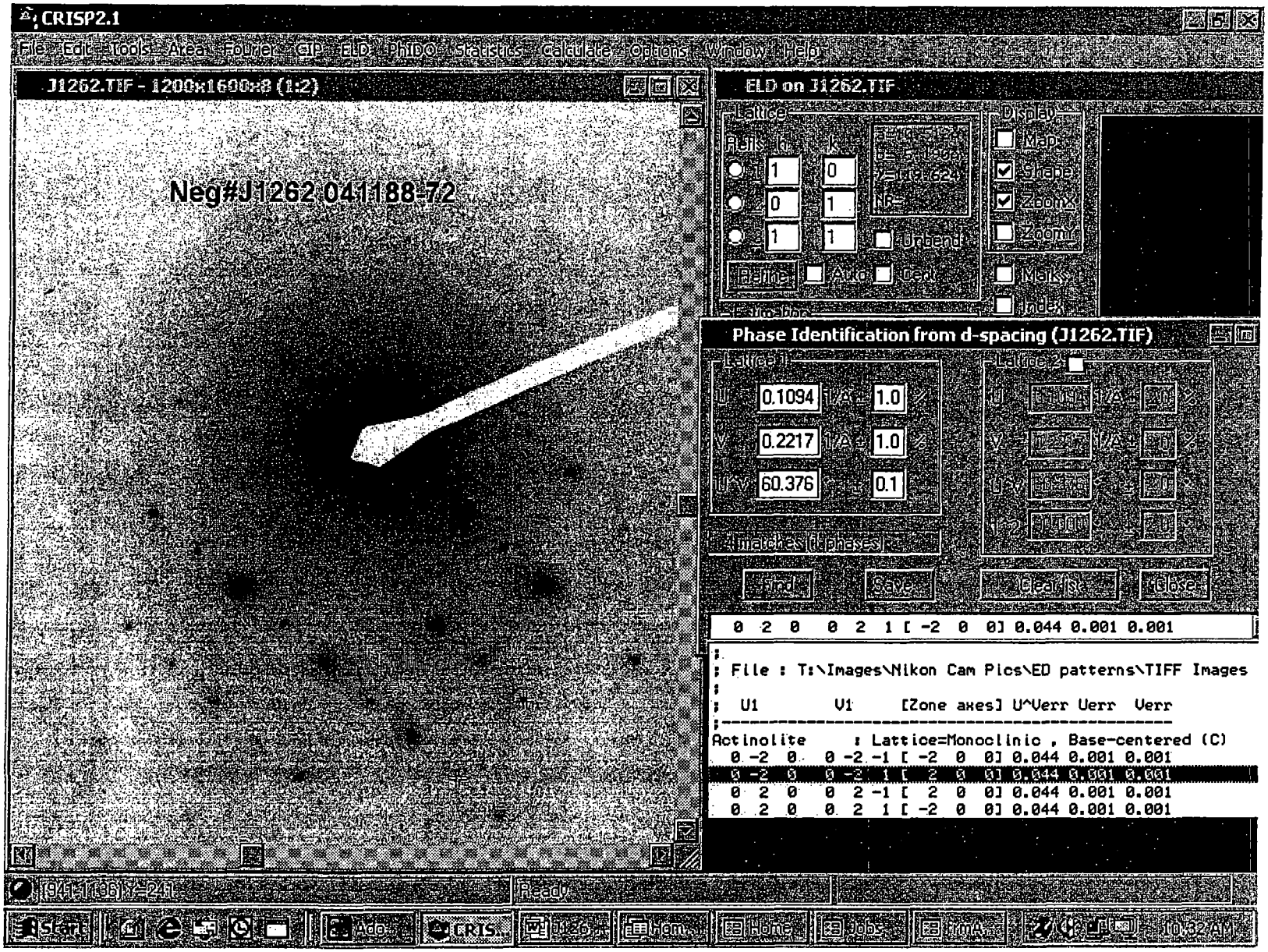
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # **041188-71-937**

Values		Satisfied Conditions
(Ca,Na)@B	1.92	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.13	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.79	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.03	Si > 7.5
Mg/(Mg+Fe2)	0.75	(Mg/(Mg+Fe2))< 0.9
Si	7.82	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
041188-72 Neg#J1262
[1 0 0]



SQMTF: QUANTIFY
Standardless Analysis

Chi-sqd = 7.80

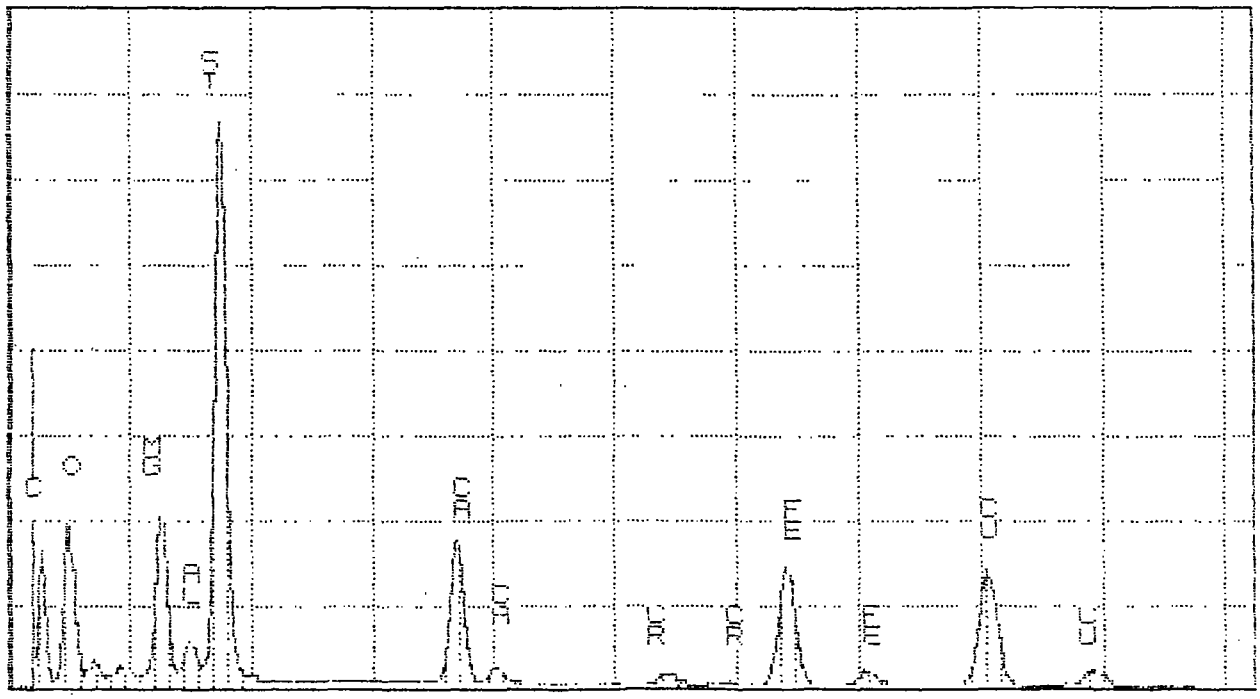
Element	Net Counts
Si-K	39178 +/- 384
Mg-K	10933 +/- 354
Al-K	3404 +/- 434
Ca-K	13404 +/- 273
Fe-K	13089 +/- 217
Na-K	568 +/- 186
K -K	276 +/- 116

REF.S ELS:SIK ELS:MGK ELS:ALK ELS:CAK ELS:FEK ELS:NAK
ELS:K K

041188-72 SP939

EL-LINE	PEAK	K-FACTOR	CEL/CREF	ATOM%	EL WT%	WT%	FORMULA
SI-K	39178	1.000	1.000	20.44	25.78	55.03	SIO2
MG-K	10933	1.000	0.274	6.66	7.19	11.99	MGO
AL-K	3404	0.750	0.065	1.48	1.68	3.17	AL2O3
CA-K	13404	0.949	0.325	4.65	8.38	11.73	CAO
FE-K	13089	1.399	0.468	4.78	12.06	17.22	FE2O3
NA-K	568	0.549	0.008	0.20	0.21	0.42	NA2O3
K-K	276	1.059	0.007	0.11	0.19	0.23	K2O
O			1.727	61.78	44.52		

TN-5500 University of Washington / JEOL MON 03-JAN-05 19:18
Cursor: 0.000keV = 0 ROI (M) 0.000: 0.000



0.000 B- 5 VFS = 4046 10 240
70 041188-72 SP939

	Wt Percent		Ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	55.23	Si+4	7.8627	7.8627							
Al2O3	3.17	Al+3	0.5318	0.1373	0.3945						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	17.22	Fe+3	0.0369			0.0369	0.0000				
MgO	11.99	Mg+2	2.5447			2.5447	0.0000				
MnO	0	Fe+2	2.0089			2.0089	0.0000				
CaO	11.73	Mn+2	0.0000			0.0000	0.0000				
Na2O	0.42	Ca+2	1.7890					1.7890	0.0000		
K2O	0.23	Na+	0.1159					0.1159	0.0000	0.0000	0.0000
		K+	0.0418							0.0418	0.0000
Total	99.99		Excess	T site	0.3945	C site	0.0000	B site	0	A site	0
			Total	8		4.9851		1.9049		0.0418	0.0000
			%Fill	100		99.7013		95.2472			

Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

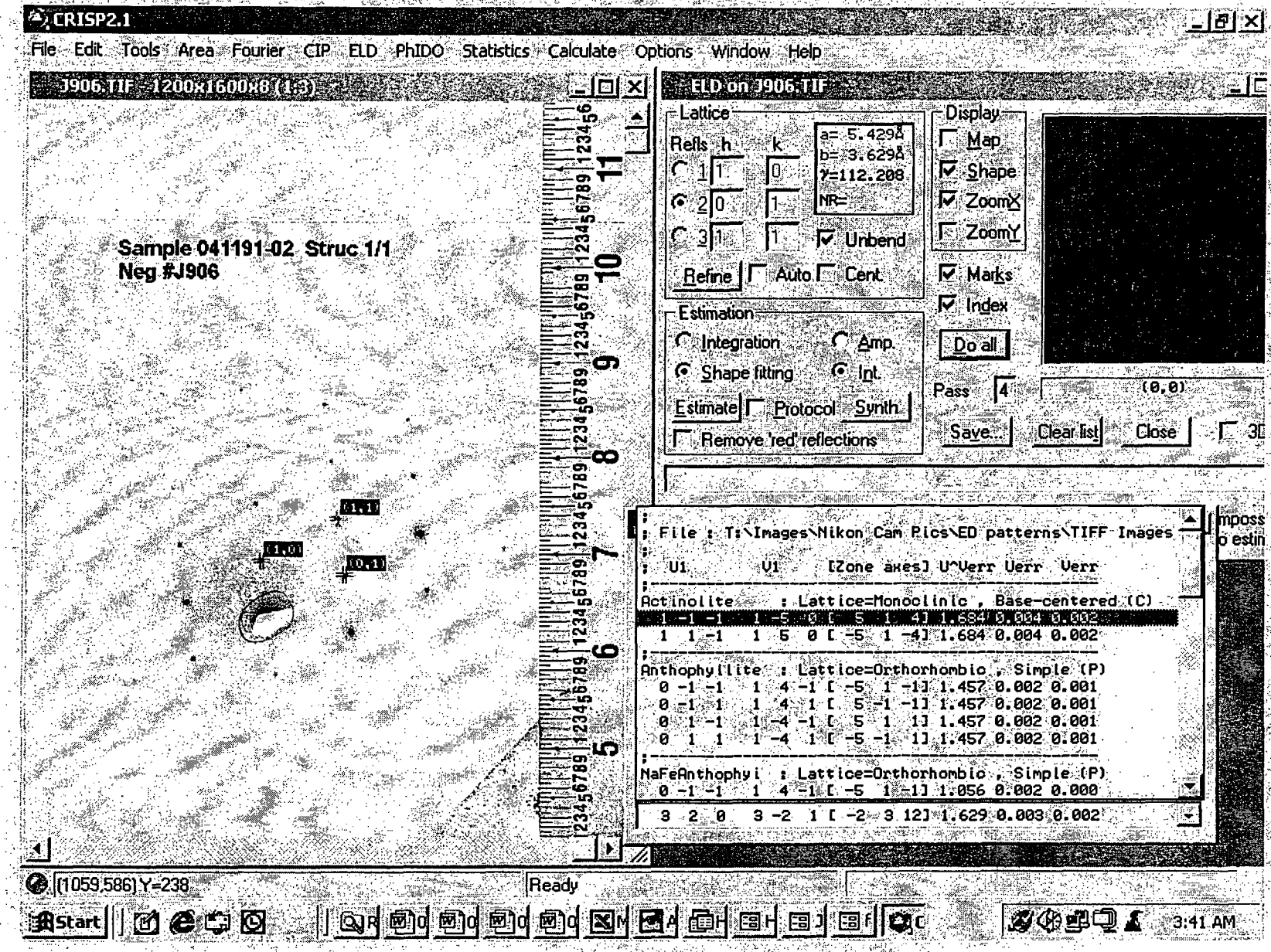
Sample # 041188-72-939

Values		Satisfied Conditions
(Ca,Na)@B	1.90	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.12	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.79	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.04	Si > 7.5
Mg/(Mg+Fe2)	0.56	(Mg/(Mg+Fe2))< 0.9
Si	7.86	

Mineral Analysis Program (Version 5.0)

ACTINOLITE

[514]



TN-5500 University of Washington / JFO [illegible] 21-OCT-04 18:39
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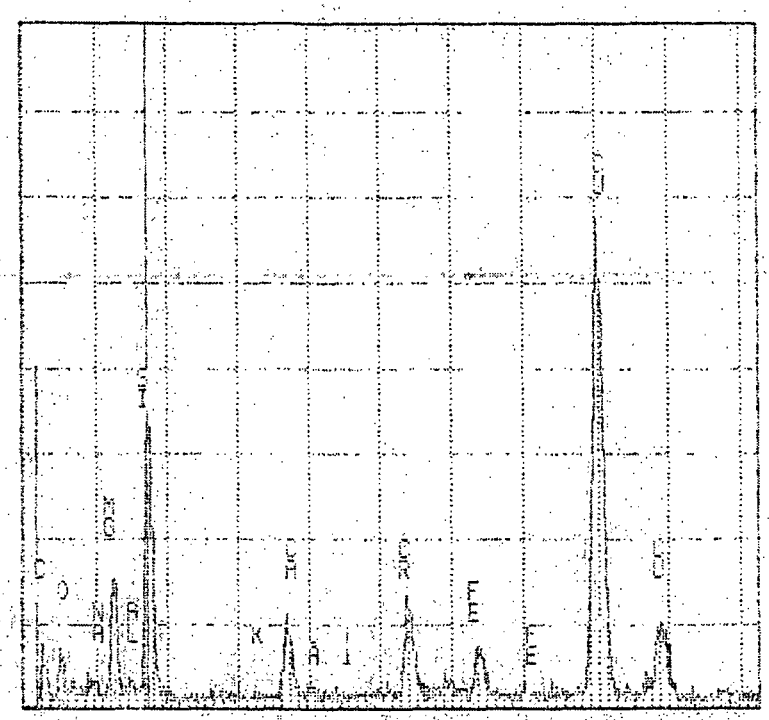


0.000 B-5 VFS = 256 10 240
76 841191-02 SP 637

*X 'CWWQMTF'

QMTF; QUANTIFY
Standardless Analysis

Refit _ALK' _ALK" _K K' _K K" _NAK' _NAK"
Refit _SIK' _K K' _CAK' _CAK" _FEK" _NAK
Chisqd = 1.4%

Element	Net Counts
Si-K	1390 +/- 58
Mg-K	492 +/- 46
Al-K	56 +/- 27
K -K	0 +/- 0
Ca-K	436 +/- 29
Fe-K	344 +/- 32
Na-K	0 +/- 0

REF:C EDS:SIK EDS:MGK EDS:ALK EDS:K K EDS:CAK EDS:FEK
EDS:NAK

841191-02 SP 637

EL-LINE	PEAK	K-FACTOR	CEL/CREF	ATOM%	EL WT%	WT%	FORMULA
SI-K	1390	1.000	1.000	21.01	26.98	57.02	SIO2
MG-K	492	1.000	0.354	8.69	9.56	15.94	MGO
AL-K	56	0.750	0.031	0.67	0.83	1.56	AL2O3
K-K	0	1.060	0.000	0.01	0.01	0.01	K2O
CA-K	436	0.949	0.299	4.39	8.06	11.23	CAO
FE-K	344	1.399	0.347	9.64	9.36	13.37	FE2O3
NA-K	0	0.549	0.000	0.01	0.01	0.01	NA2O
O			1.675	61.58	46.19		

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	57.82	Si+4	7.9835	7.9835							
Al2O3	1.56	Al+3	0.2538	0.0165	0.2374						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	13.37	Fe+3	0.4028			0.4028	0.0000				
MgO	15.94	Mg+2	3.2812			3.2812	0.0000				
MnO	0	Fe+2	1.0960			1.0786	0.0174				
CaO	11.28	Mn+2	0.0000			0.0000	0.0000				
Na2O	0.01	Ca+2	1.6686					1.6686	0.0000		
K2O	0.01	Na+	0.0027					0.0027	0.0000	0.0000	0.0000
		K+	0.0018							0.0018	0.0000
Total	99.99		Excess	T site	0.2374	C site	0.0174	B site	0	A site	0
			Total	8		5.0000		1.6713		0.0018	0.0000
			%Fill	100		100		83.5628			

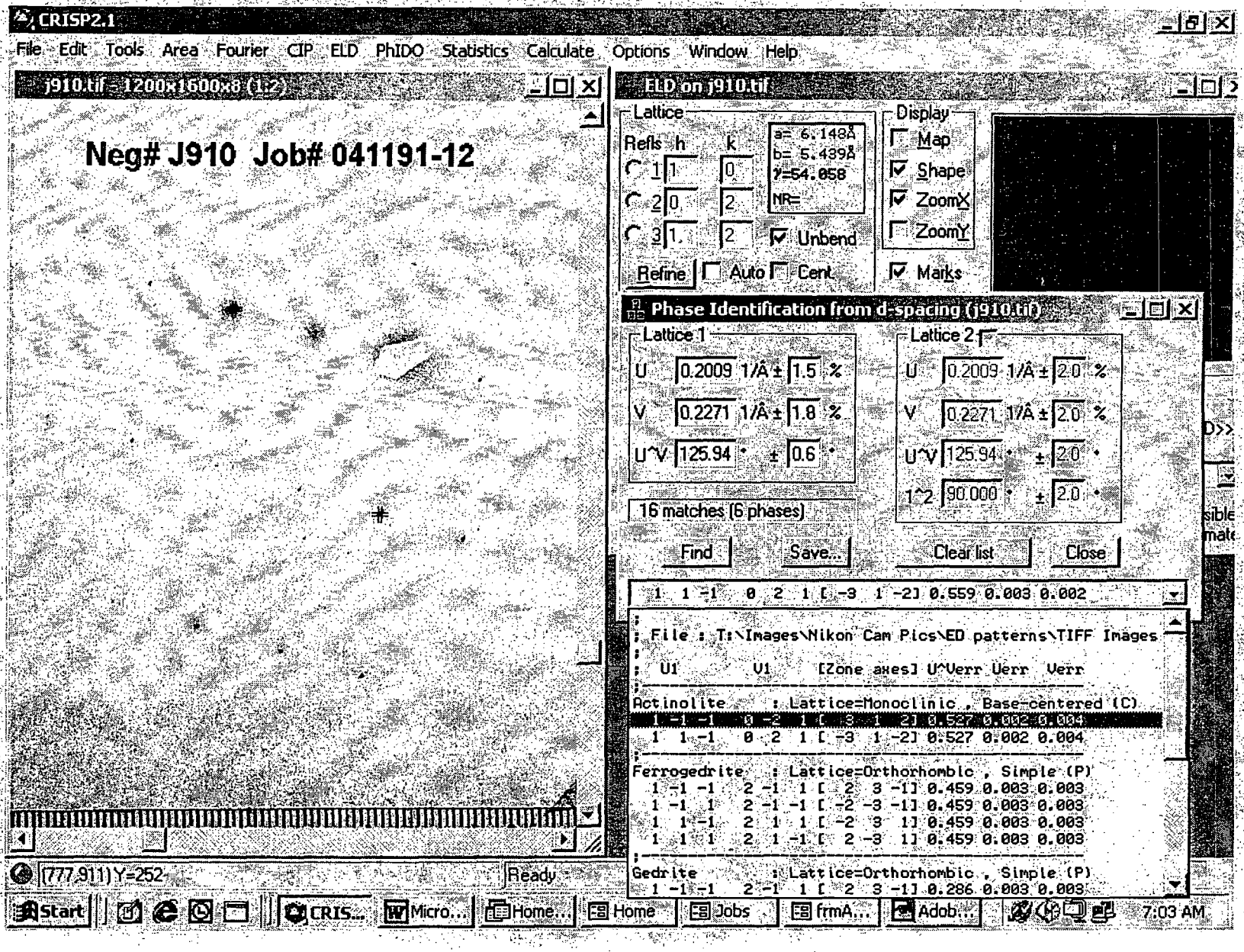
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-02-637

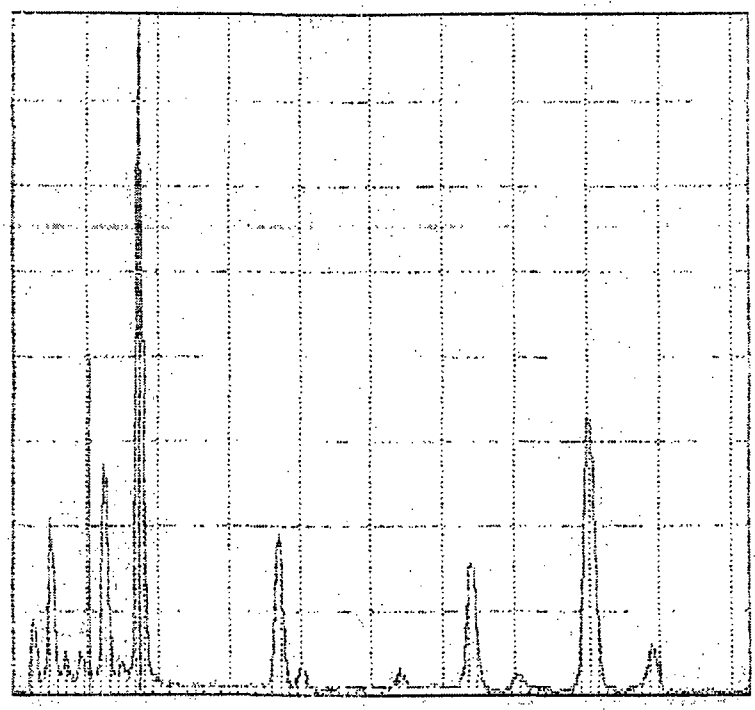
Values		Satisfied Conditions
(Ca,Na)@B	1.67	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.67	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.75	(Mg/(Mg+Fe2))< 0.9
Si	7.98	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[3 1 2]



TN-5500 University of Washington / JEOL FRI 22-OCT-04 01:48
Cursor: 1.740keV = 1056



0.000 NA-11 VFS = 1024 10.240
32 041191-12 SP 642

*X /SQ,TF\I-\J\,MTF

SQMTF: QUANTIFY
Standardless Analysis

Refit _K K' _K K" _NAK' _NAK"
Refit _MGK' _ALK' _ALK" _NAK
Chi-sqd = 3.48

Element	Net Counts	
Si-K	11331 +/-	151
Mg-K	3594 +/-	113
Al-K	349 +/-	62
K -K	39 +/-	27
Ca-K	3479 +/-	117
Fe-K	3444 +/-	116
Na-K	0 +/-	0

REF.S EDS:SIK EDS:MGK EDS:ALK EDS:K K EDS:CAK EDS:FEK
EDS:NAK

041191-12 SP 642

EL-LINE	PEAK	K-FACTOR	CEL/CREF	ATOM%	EL WT%	WT%	FORMULA
SI-K	11331	1.000	1.000	21.08	26.77	57.39	SIO2
MG-K	3594	1.000	0.317	7.80	8.49	14.15	MGO
AL-K	349	0.750	0.020	0.51	0.62	1.17	AL2O3
K-K	39	1.060	0.004	0.06	0.10	0.12	K2O
CA-K	3479	0.949	0.292	4.30	7.81	10.93	CAO
FE-K	3444	1.399	0.426	4.49	11.37	16.27	FE2O3
NA-K	0	0.549	0.000	0.00	0.00	0.00	NA2O
			1.675	61.77	44.33		

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	57.35	Si+4	8.0000	8.0000							
Al2O3	1.17	Al+3	0.1949	0.0000	0.1949						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	16.27	Fe+3	0.4294			0.4294	0.0000				
MgO	14.15	Mg+2	2.9558			2.9558	0.0000				
MnO	0	Fe+2	1.4301			1.4199	0.0102				
CaO	10.93	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.6416					1.6416	0.0000		
K2O	0.12	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0237							0.0237	0.0000
Total	99.99		Excess	T site	0.1949	C site	0.0102	B site	0	A site	0
			Total	8		5.0000		1.6416		0.0237	0.0000
			%Fill	100		100		82.0782			

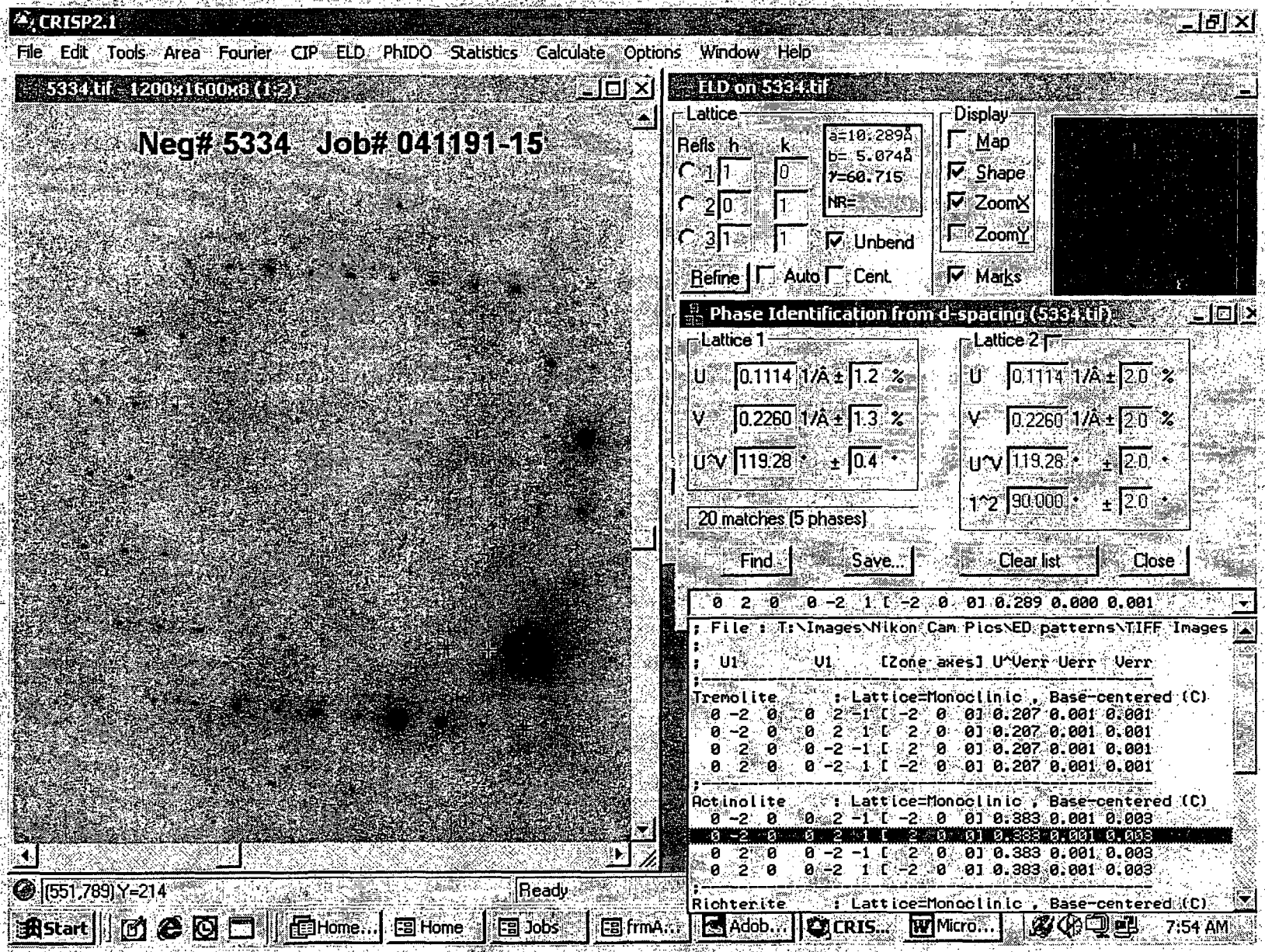
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # 041191-12-642

Values		Satisfied Conditions
(Ca,Na)@B	1.64	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.64	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.02	Si > 7.5
Mg/(Mg+Fe2)	0.67	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[100]



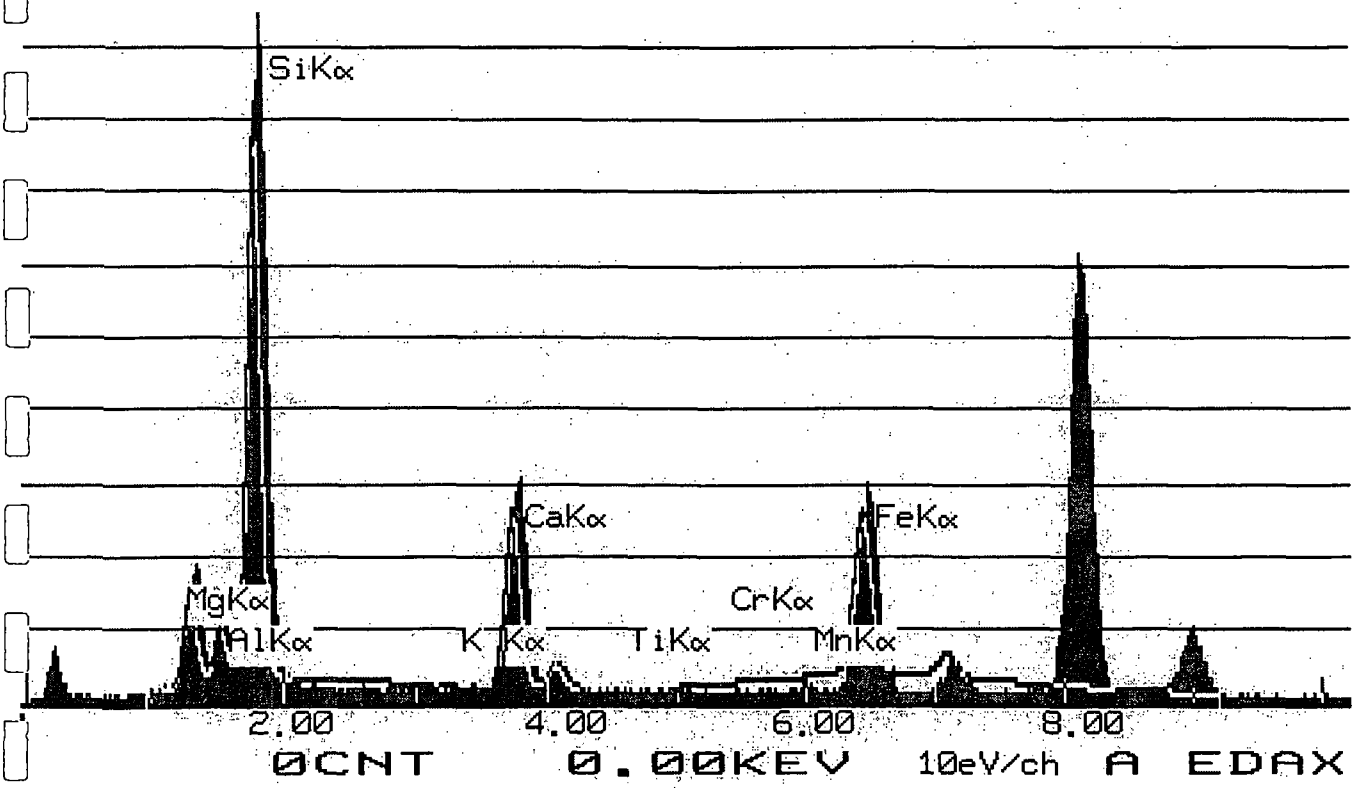
INTE-% :
LABEL = 041191-15 15242
04-DEC-72 01:00:35
29.926 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	83.438	7.261	12.039
ALK	48.653	2.543	4.805
SIK	511.289	25.023	53.533
CAK	189.365	8.836	12.363
FEK	194.745	12.072	17.259

TOTAL			100.000

USED PEIF: USER

03-DEC-04 01:01:15 SUPER QUANT
RATE= 6CPS TIME= 29LSEC
FS= 1857/ 1857 PRST= 200LSEC
A =041191-15 15242



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	53.533	Si+4	7.6197	7.6197							
Al2O3	4.805	Al+3	0.8060	0.3803	0.4257						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	17.259	Fe+3	0.1479			0.1479	0.0000				
MgO	12.039	Mg+2	2.5547			2.5547	0.0000				
MnO	0	Fe+2	1.8898			1.8717	0.0181				
CaO	12.363	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.8852					1.8852	0.0000		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	99.999		Excess	T site	0.4257	C site	0.0181	B site	0	A site	0
			Total	8		5.0000		1.8852		0.0000	0.0000
			%Fill	100		100		94.2613			

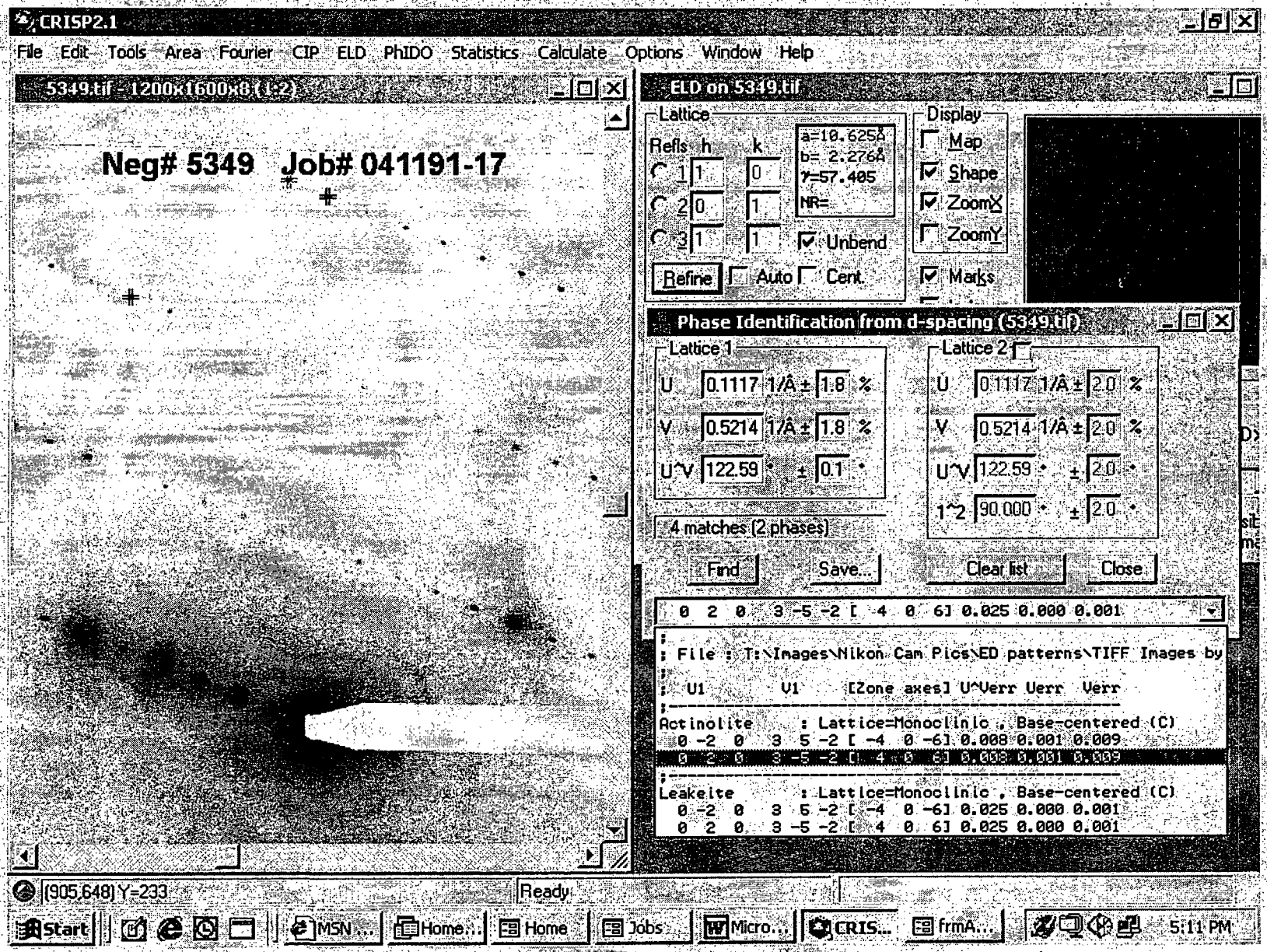
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-15-15242

Values		Satisfied Conditions
(Ca,Na)@B	1.89	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.89	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.57	(Mg/(Mg+Fe2))< 0.9
Si	7.62	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[203]

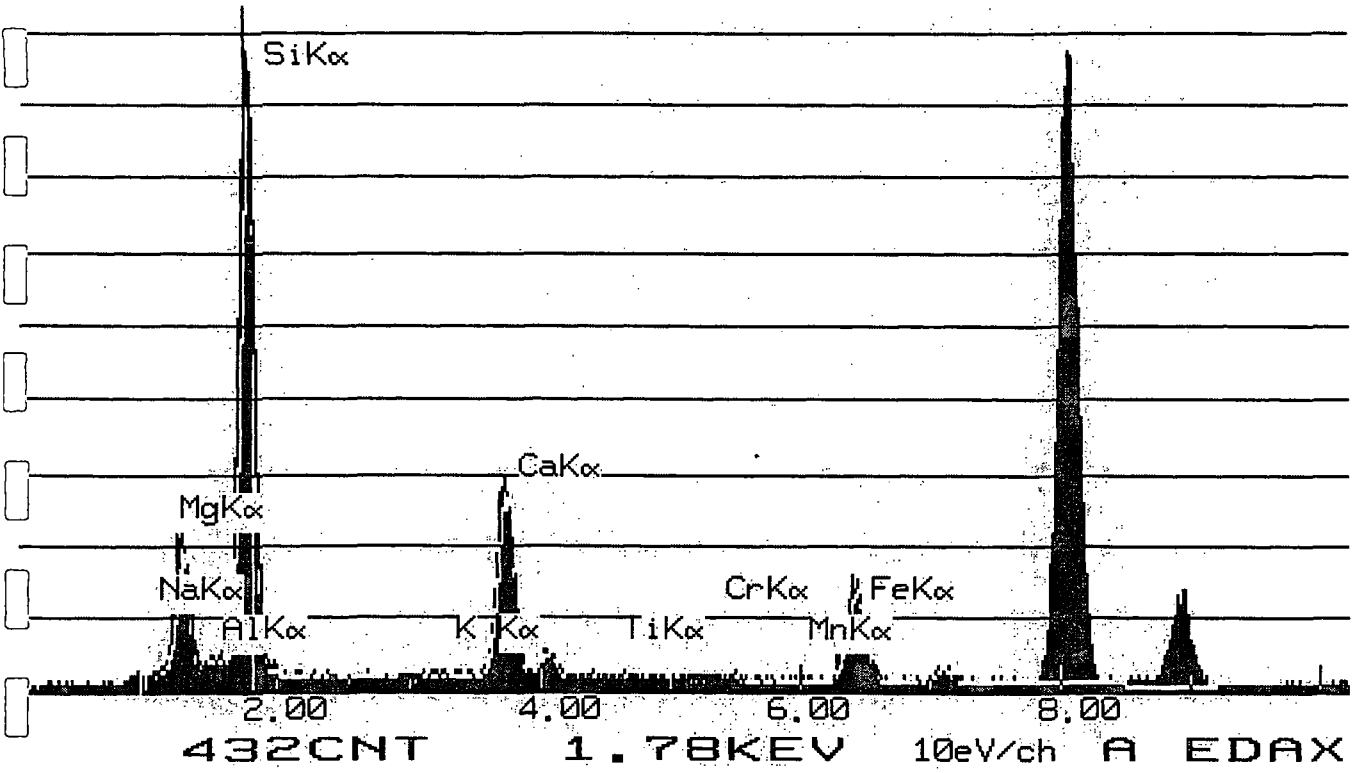


INTE-% :
LABEL = 041191-17 SP 15252
04-JAN-73 16:45:27
78.975 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	21.906	9.722	16.121
ALK	2.292	0.611	1.155
SIK	110.099	27.483	58.795
CAK	41.216	9.809	13.725
FEK	22.577	7.138	10.205
TOTAL			100.000

USED PEIF: USER

03-JAN-05 16:45:47 SUPER QUANT
RATE= 5872CPS TIME= 79LSEC
FS= 1019/ 1019 PRST= 200LSEC
A =041191-17 SP 15252



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	58.795	Si+4	8.0000	8.0000							
Al2O3	1.155	Al+3	0.1994	0.0000	0.1994						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	10.205	Fe+3	0.0182			0.0182	0.0000				
MgO	16.121	Mg+2	3.3414			3.3414	0.0000				
MnO	0	Fe+2	1.1808			1.1808	0.0000				
CaO	13.725	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	2.0475					2.0000	0.0475		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100.001		Excess	T site	0.1994	C site	0.0000	B site	0.0475143	A site	0
			Total	8		4.7398		2.0000		0.0000	0.0000
			%Fill	100		94.796		100			

Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

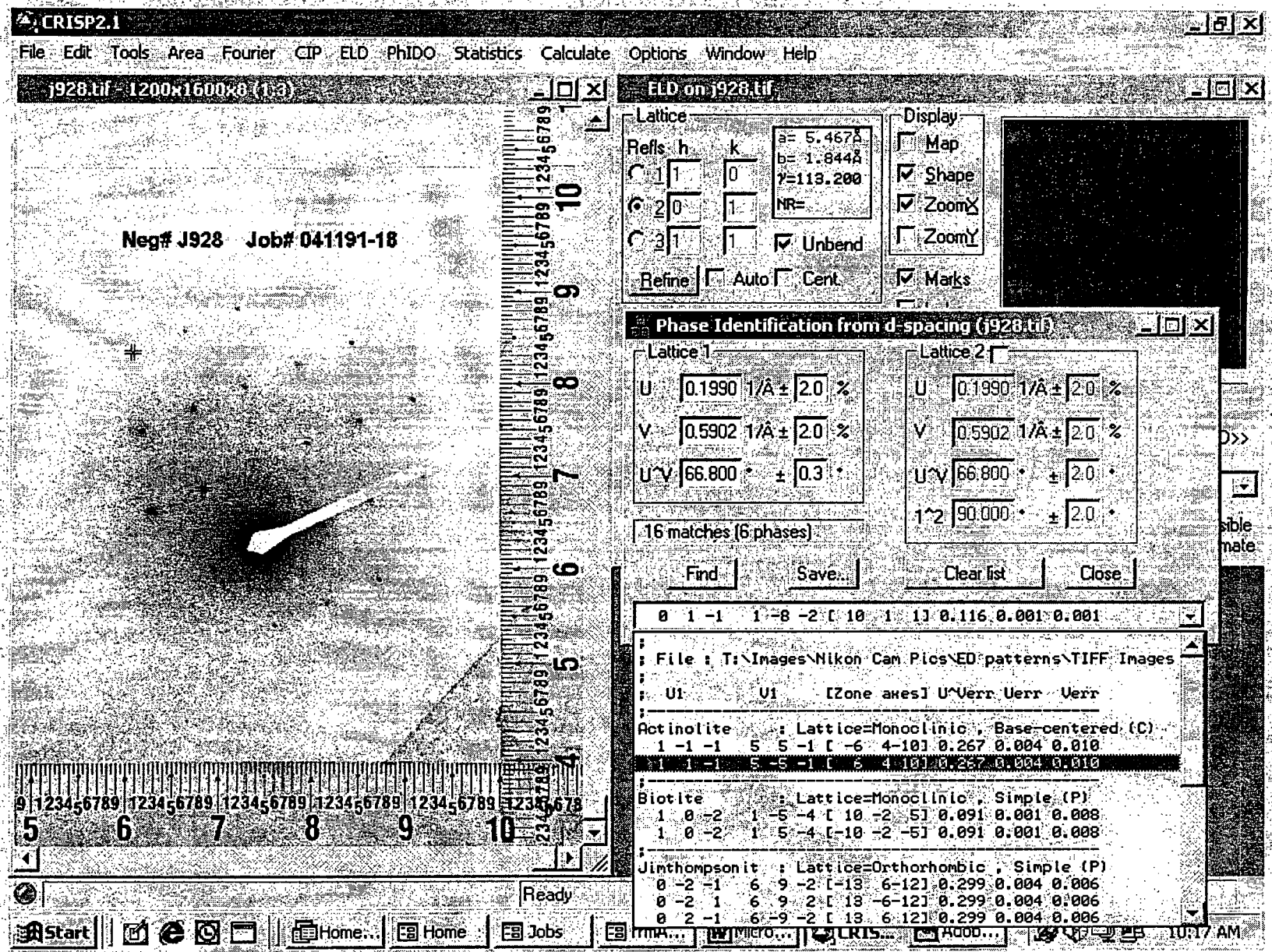
Sample # 041191-17-15252

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.74	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

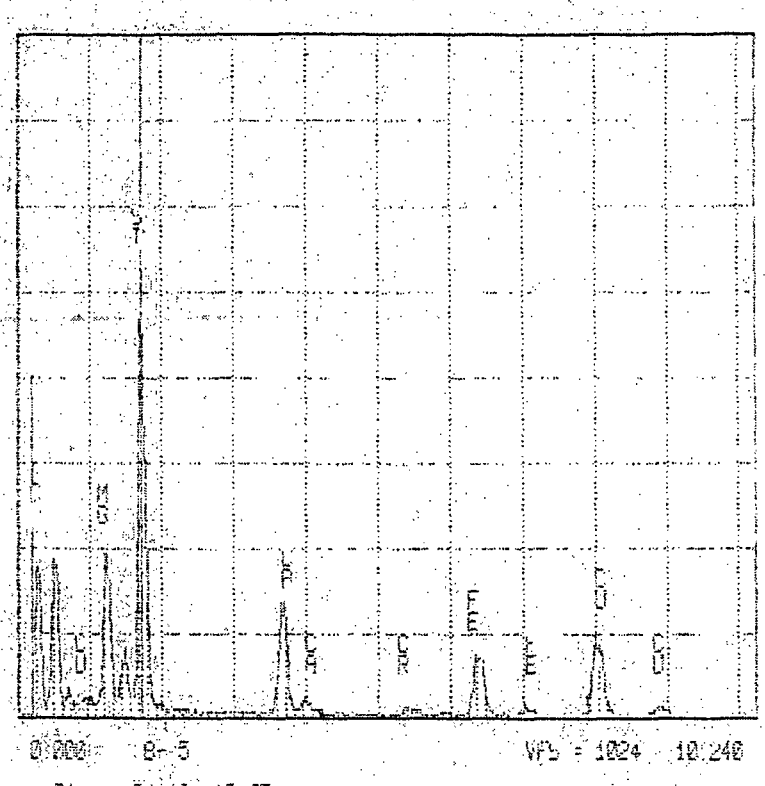
Mineral Analysis Program (Version 5.0)

ACTINOLITE

[325]



TN-5500 University of Washington / JEOL MON 25-OCT-04 05:17
Dunsch: 1.720keV = 637



24 041191-18 671

*> SQMTF

SQMTF: QUANTIF,
Standardless Analysis

Refit _K K' _K K"
Refit _MGK" _ALK" _K K
Chi-sqd = 2.13

Element	Net Counts
Si-K	7384 +/- 142
Mg-K	2754 +/- 77
Al-K	1026 +/- 50
K -K	0 +/- 0
Ca-K	2362 +/- 97
Fe-K	1797 +/- 85
Na-K	109 +/- 20

REF.S EDS:SIK EDS:MGK EDS:ALK EDS:K K EDS:CAK EDS
EDS:NAK

041191-18 671

EL-LINE	PEAK	K-FACTOR	CEL/CREF	ATOM%	EL WT%	WT%	FORMULA
SI-K	7384	1.000	1.000	19.93	25.70	55.00	SIO2
MG-K	2754	1.000	0.373	8.67	9.59	15.93	MGO
AL-K	1026	0.750	0.104	2.16	2.48	5.04	AL2O3
K-K	0	1.060	0.000	0.00	0.00	0.00	K2O
CA-K	2362	0.949	0.304	4.24	7.81	10.94	CAO
FE-K	1797	1.399	0.341	3.40	8.76	12.51	FE2O3
NA-K	109	0.549	0.008	0.20	0.21	0.43	NA2O3
O			1.760	41.48	45.25		

1.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	55.08	Si+4	7.5714	7.5714							
Al2O3	5.06	Al+3	0.8197	0.4286	0.3911						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.51	Fe+3	0.6340			0.6340	0.0000				
MgO	15.98	Mg+2	3.2748			3.2748	0.0000				
MnO	0	Fe+2	0.7334			0.7000	0.0333				
CaO	10.94	Mn+2	0.0000			0.0000	0.0000				
Na2O	0.43	Ca+2	1.6111					1.6111	0.0000		
K2O	0	Na+	0.1146					0.1146	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100		Excess	T site	0.3911	C site	0.0333	B site	0	A site	0
			Total	8		5.0000		1.7257		0.0000	0.0000
			%Fill	100		100		86.2846			

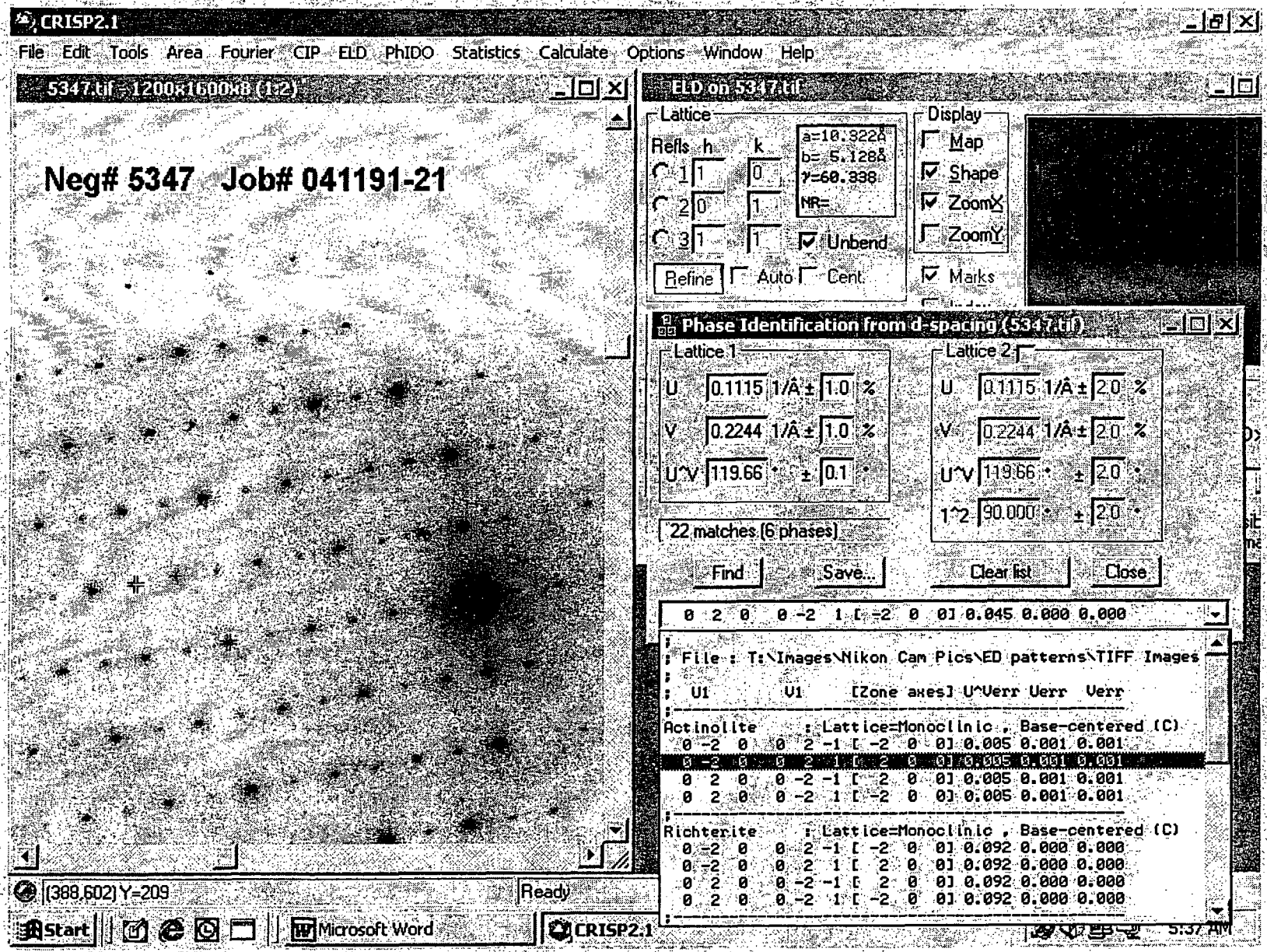
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # 041191-18-671

Values		Satisfied Conditions
(Ca,Na)@B	1.73	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.11	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.61	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.82	(Mg/(Mg+Fe2))< 0.9
Si	7.57	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[100]

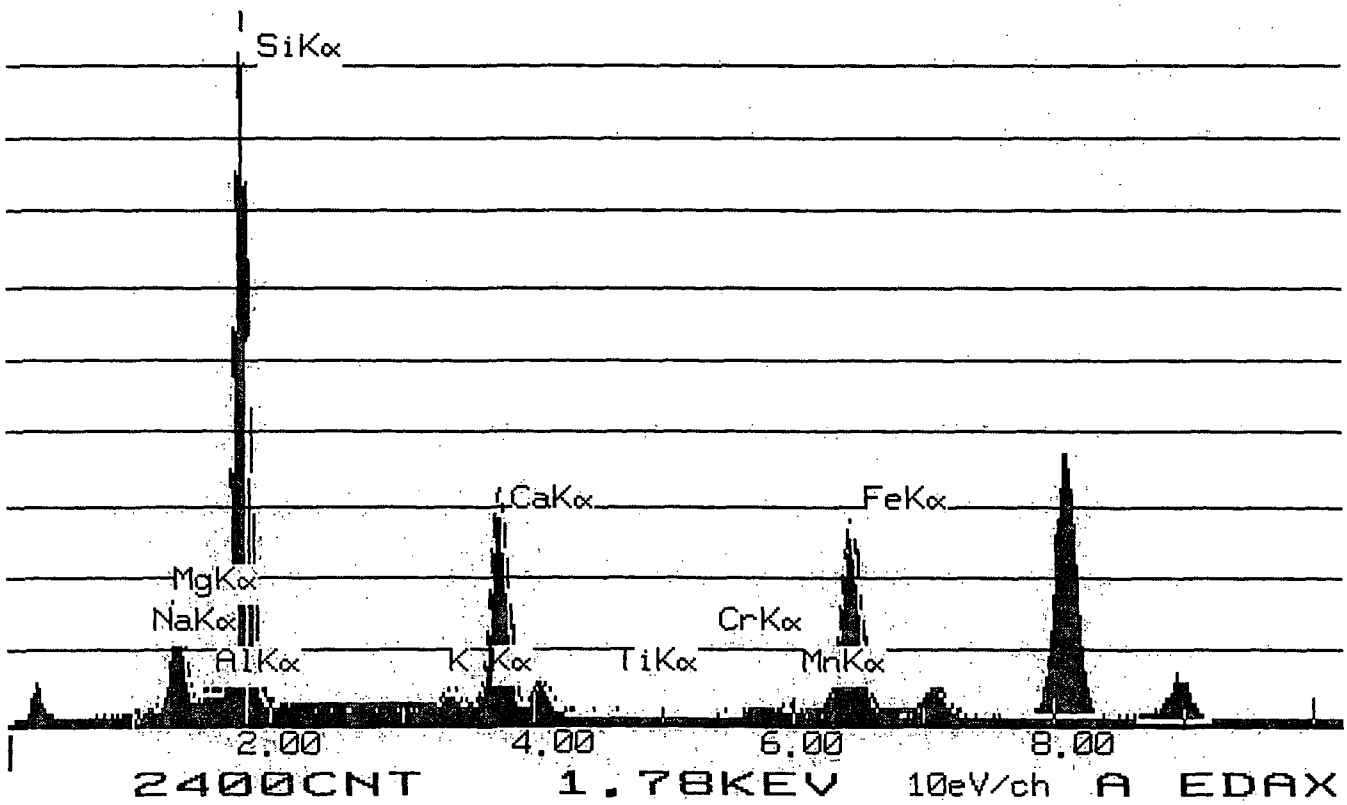


INTE-% :
LABEL = 041191-21 15250
04-JAN-73 01:56:28
87.870 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	59.349	8.248	13.676
ALK	7.500	0.626	1.183
SIK	324.558	25.369	54.273
K K	8.558	1.112	1.339
CAK	120.530	8.982	12.568
MNK	1.332	0.143	0.185
FEK	118.516	11.733	16.775
TOTAL			100.000

USED PEIF: USER

03-JAN-05 01:56:48 SUPER QUANT
RATE= 1957CPS TIME= 88LSEC
FS= 2895/ 2895 PRST= 200LSEC
A =041191-21 15250



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.273	Si+4	7.8176	7.8176							
Al2O3	1.183	Al+3	0.2008	0.1824	0.0184						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	16.775	Fe+3	0.0545			0.0545	0.0000				
MgO	13.676	Mg+2	2.9368			2.9368	0.0000				
MnO	0.185	Fe+2	1.9599			1.9599	0.0000				
CaO	12.568	Mn+2	0.0226			0.0226	0.0000				
Na2O	0	Ca+2	1.9395					1.9395	0.0000		
K2O	1.339	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.2460							0.2460	0.0000
Total	99.999		Excess	T site	0.0184	C site	0.0000	B site	0	A site	0
			Total	8		4.9922		1.9395		0.2460	0.0000
			%Fill	100		99.8446		96.9726			

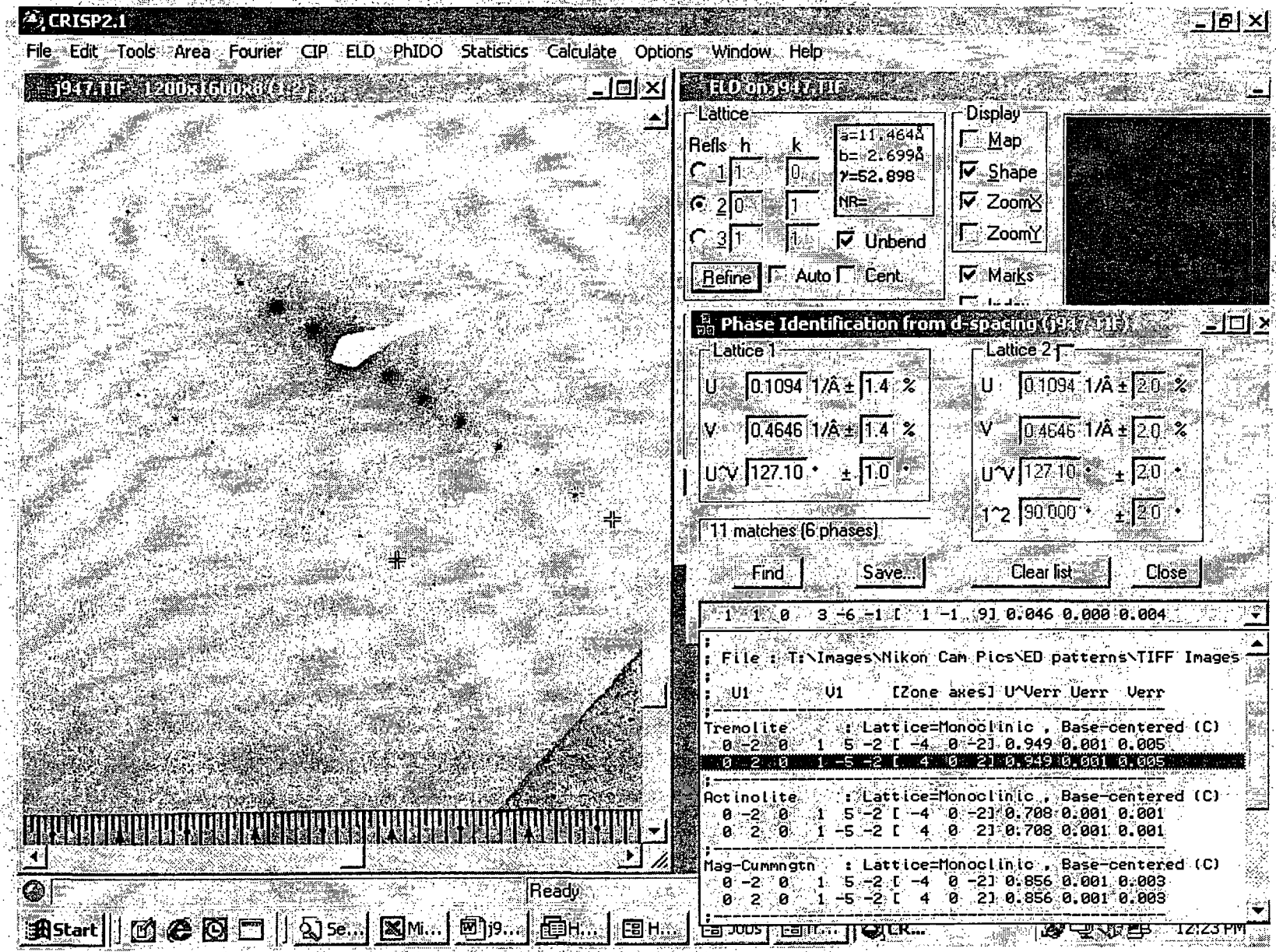
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # 041191-21-15250

Values		Satisfied Conditions
(Ca,Na)@B	1.94	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.94	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.25	Si > 7.5
Mg/(Mg+Fe2)	0.60	(Mg/(Mg+Fe2))< 0.9
Si	7.82	

Mineral Analysis Program (Version 5.0)

Neg# J947 Job# 041191-25
TREMOLITE
[2 0 1]



TN-5500 University of Washington / JRA THU 28-OCT-04 07:35
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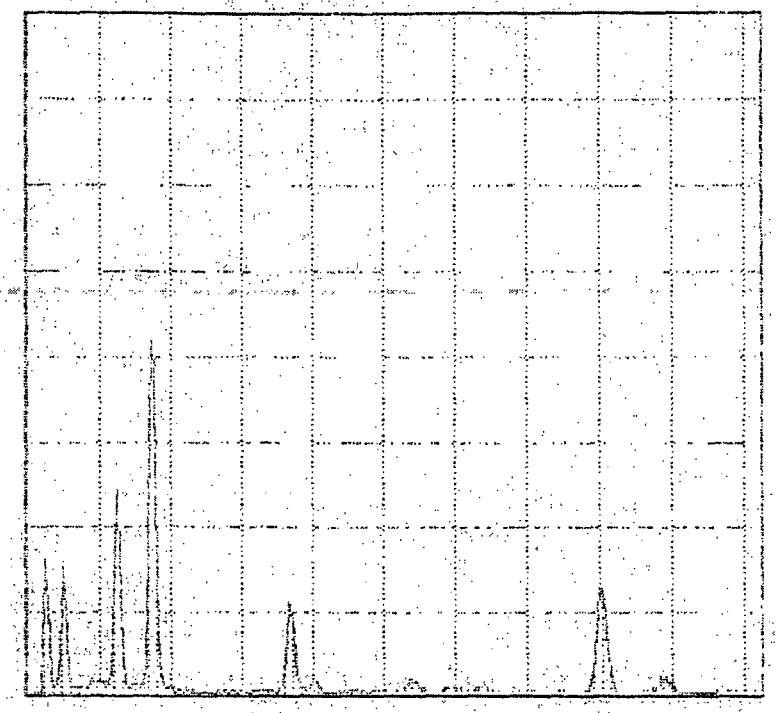


0.000 VFS = 1024 10.240

0 041191-25 SP 690

SQMTF: QUANTIFY
Standardless Analysis

Refit _ALK' _ALK" _K K' _K K" _NAK' _NAK"
Refit _ALK _K K _FEK" _NAK
Chi-sqd = 1.75

Element	Net Counts	
Si-K	6148 +/-	104
Mg-K	2095 +/-	79
Al-K	0 +/-	0
K-K	0 +/-	0
Ca-K	2012 +/-	89
Fe-K	196 +/-	29
Na-K	0 +/-	0

REF.S EDS:SIK EDS:MGK EDS:ALK EDS:K K EDS:CAK EDS:FEK
EDS:NAK

041191-25 SP 690

EL-LINE	PEAK	K-FACTOR	CEL/CREF	ATOM%	H WT%	WT%	FORMULA
SI-K	6148	1.000	1.000	21.61	28.95	67.00	SIO2
MG-K	2095	1.000	0.487	12.06	14.11	23.41	MGO
AL-K	0	0.758	0.000	0.00	0.00	0.00	AL2O3
K-K	0	1.060	0.000	0.00	0.00	0.00	K2O
CA-K	2012	0.949	0.311	4.70	9.00	12.00	CAO
FE-K	196	1.399	0.045	0.48	1.29	1.85	FE2O3
NA-K	0	0.549	0.000	0.00	0.00	0.00	NA2O3
O			1.611	60.99	46.45		

1.00
*
0.0

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	62.03	Si+4	8.0000	8.0000							
Al2O3	0	Al+3	0.0000	0.0000	0.0000						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	1.85	Fe+3	0.0344			0.0344	0.0000				
MgO	23.51	Mg+2	4.6983			4.6983	0.0000				
MnO	0	Fe+2	0.2255			0.2255	0.0000				
CaO	12.6	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.8331					1.8331	0.0000		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	99.99		Excess	T site	0.0000	C site	0.0000	B site	0	A site	0
			Total	8		4.9582		1.8331		0.0000	0.0000
			%Fill	100		99.1637		91.653			

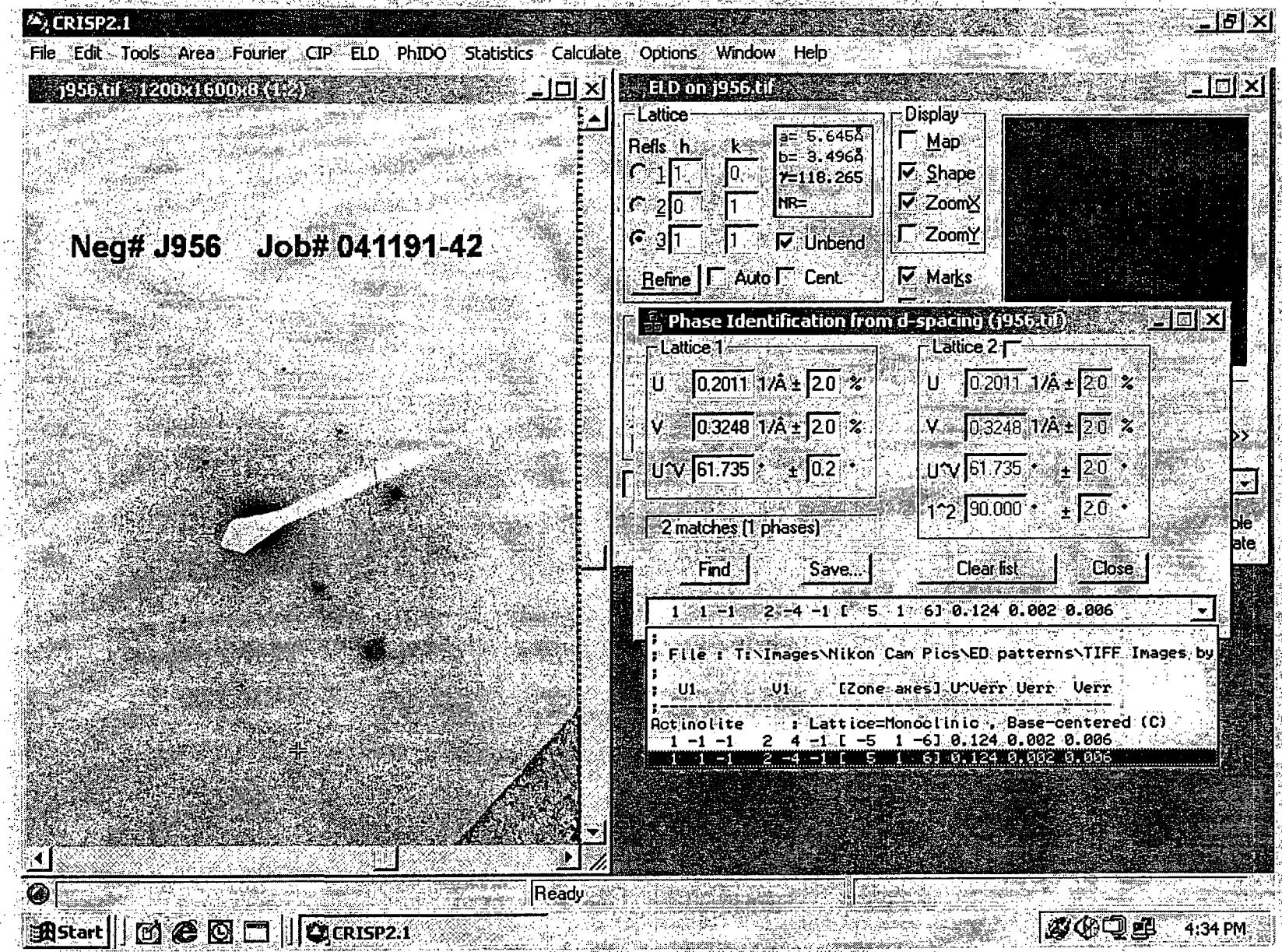
Prefix	none
Name	tremolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-25-690

Values		Satisfied Conditions
(Ca,Na)@B	1.83	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.83	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.95	(Mg/(Mg+Fe2))>= 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[516]



TN-600 University of Washington (TPN) SAT 30-OCT-84 09:57
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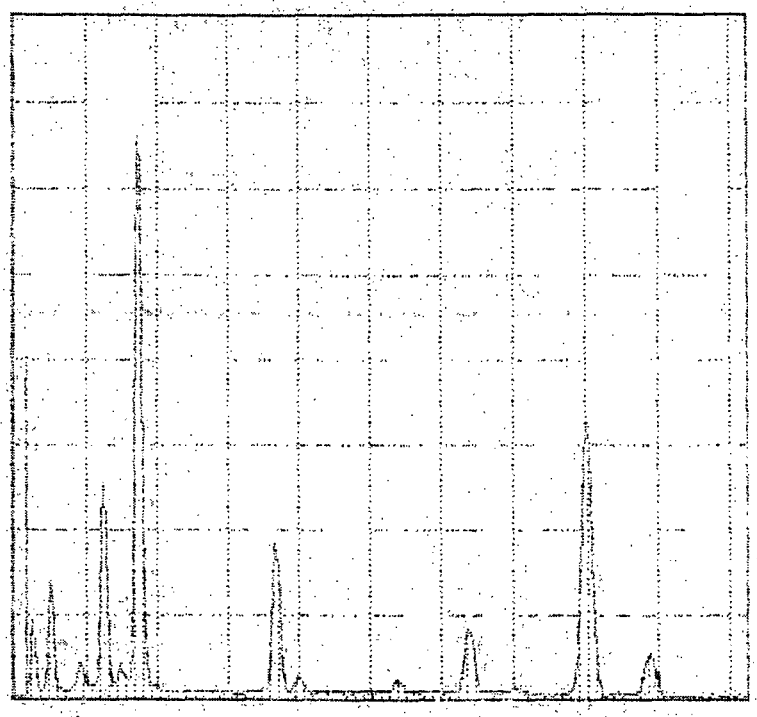


0.000 B- S VFS = 2048 10.240
164 041191-42 SP 695

BX 'SOMRCNTF'

TN FLEA:RAN D10-BJ

SX 'QUMLEA'
SOMTP 'MODANTOFY'
SOCOR F3R600 Standardless Analysis

Refit: _NAK' _NAK"
Refit: _ALK' _ALK" _K K' _FEK" _NAK
Chi-sqd = 6.94

Element	Net Counts
Si-K	19312 +/- 179
Mg-K	6840 +/- 152
Al-K	886 +/- 99
K -K	214 +/- 96
Ca-K	6511 +/- 162
Fe-K	3697 +/- 90
Na-K	0 +/- 0

REF.S EDS:SIK EDS:MGK EDS:ALK EDS:K K EDS:CAK EDS:FEK
EDS:NAK

041191-42 SP 695

EL-LINE	PEAK	K-FACTOR	CEL/CREF	ATOM%	EL WT%	WT%	FORMULA
SI-K	19312	1.000	1.000	21.72	27.44	58.81	SIO2
MG-K	6840	1.000	0.354	8.77	5.72	16.20	MGO
AL-K	886	0.750	0.304	0.76	0.95	1.79	AL2O3
K -K	214	1.060	0.012	0.18	0.32	0.34	K2O
CA-K	6511	0.949	0.320	4.46	[illegible]	12.31	CAO
FE-K	3697	1.379	0.268	2.84	7.36	10.51	FE2O3
NA-K	0	0.549	0.000	0.00	0.00	0.00	NA2O
			[illegible]	[illegible]	[illegible]		

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	58.81	Si+4	8.0000	8.0000							
Al2O3	1.79	Al+3	0.2991	0.0000	0.2991						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	10.51	Fe+3	0.0165			0.0165	0.0000				
MgO	16.2	Mg+2	3.3449			3.3449	0.0000				
MnO	0	Fe+2	1.2095			1.2095	0.0000				
CaO	12.31	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.8304					1.8304	0.0000		
K2O	[illegible]	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
										0.0780	0.0000
[illegible]	[illegible]		[illegible]	[illegible]		[illegible] site	[illegible]	site	0	A site	0
		Total		8		4.8699		1.8304		0.0780	0.0000
		%Fill		100		97.3989		91.5181			

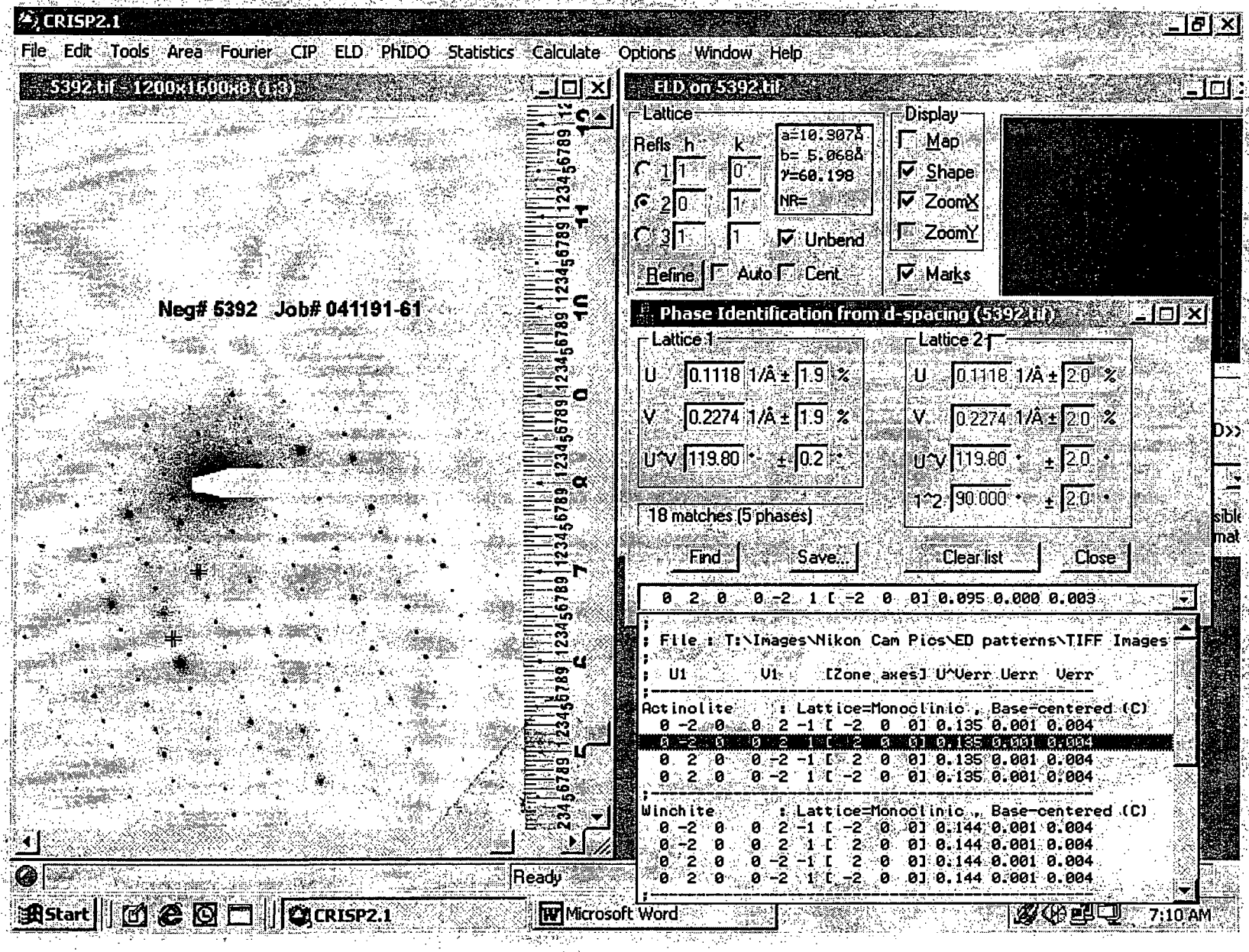
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-42-695

Values		Satisfied Conditions
(Ca,Na)@B	1.83	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.83	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.08	Si > 7.5
Mg/(Mg+Fe2)	0.73	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[100]



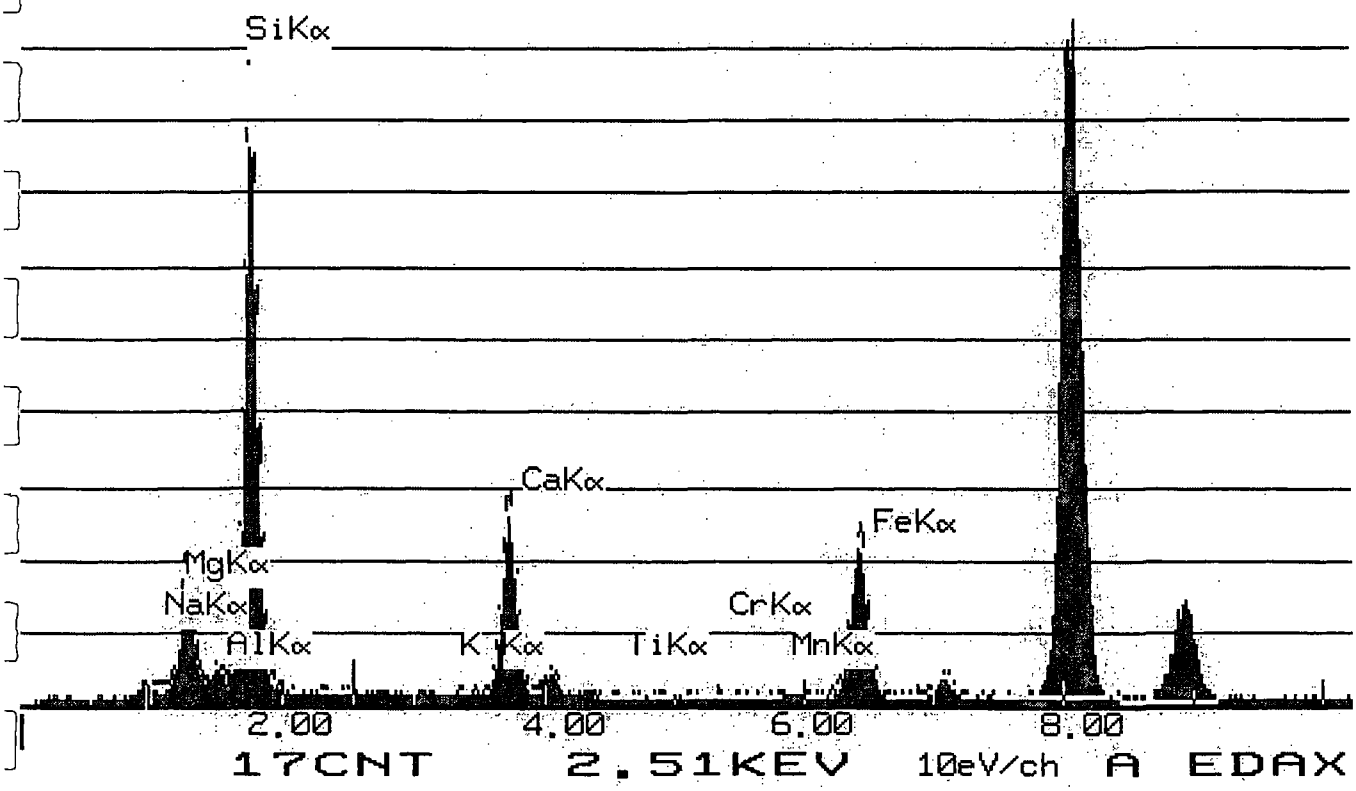
INTE-% :
LABEL = 041191-61 15287
10-JAN-73 21:42:41
67.627 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	26.720	9.066	15.032
ALK	3.416	0.696	1.315
SIK	132.890	25.358	54.250
K K	0.695	0.220	0.265
CAK	48.974	8.910	12.467
MNK	1.153	0.303	0.391
FEK	47.111	11.386	16.279

TOTAL			100.000

USED PEIF: USER

09-JAN-05 21:43:11 SUPER QUANT
RATE= 28CPS TIME= 67LSEC
FS= 1011/ 1011 PRST= 200LSEC
A =041191-61 15287



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.25	Si+4	7.6959	7.6959							
Al2O3	1.315	Al+3	0.2198	0.2198	0.0000						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	16.279	Fe+3	0.5213			0.5213	0.0000				
MgO	15.032	Mg+2	3.1791			3.1791	0.0000				
MnO	0.391	Fe+2	1.3517			1.2996	0.0521				
CaO	12.467	Mn+2	0.0470			0.0000	0.0470				
Na2O	0	Ca+2	1.8947					1.8947	0.0000		
K2O	0.265	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0480							0.0480	0.0000
Total	99.999		Excess	T site	0.0000	C site	0.0991	B site	0	A site	0
			Total	7.9157		5.0000		1.8947		0.0480	0.0000
			%Fill	98.947		100		94.7357			

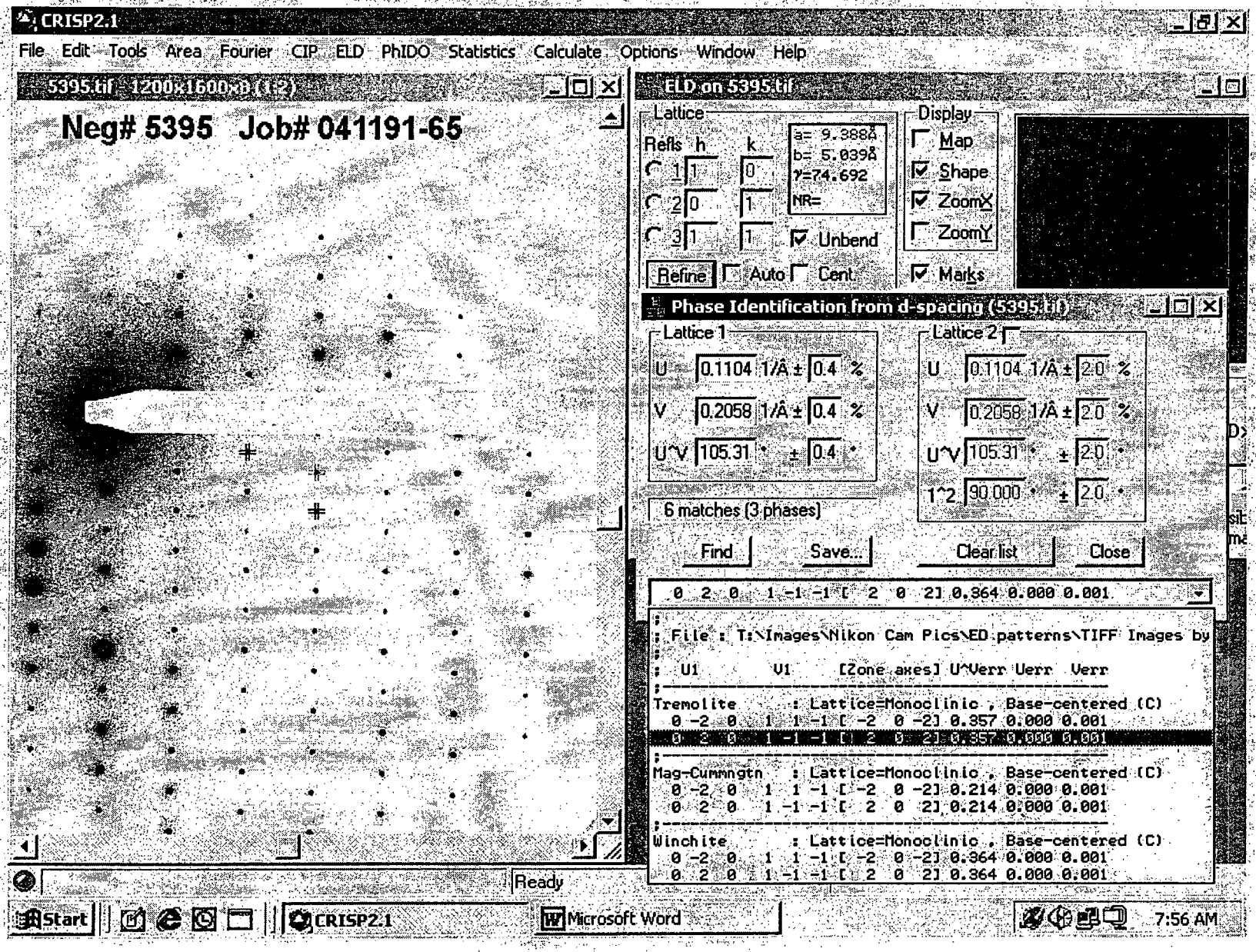
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-61-15287

Values		Satisfied Conditions
(Ca,Na)@B	1.89	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.89	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.05	Si > 7.5
Mg/(Mg+Fe2)	0.70	(Mg/(Mg+Fe2))< 0.9
Si	7.70	

Mineral Analysis Program (Version 5.0)

TREMOLITE
[101]

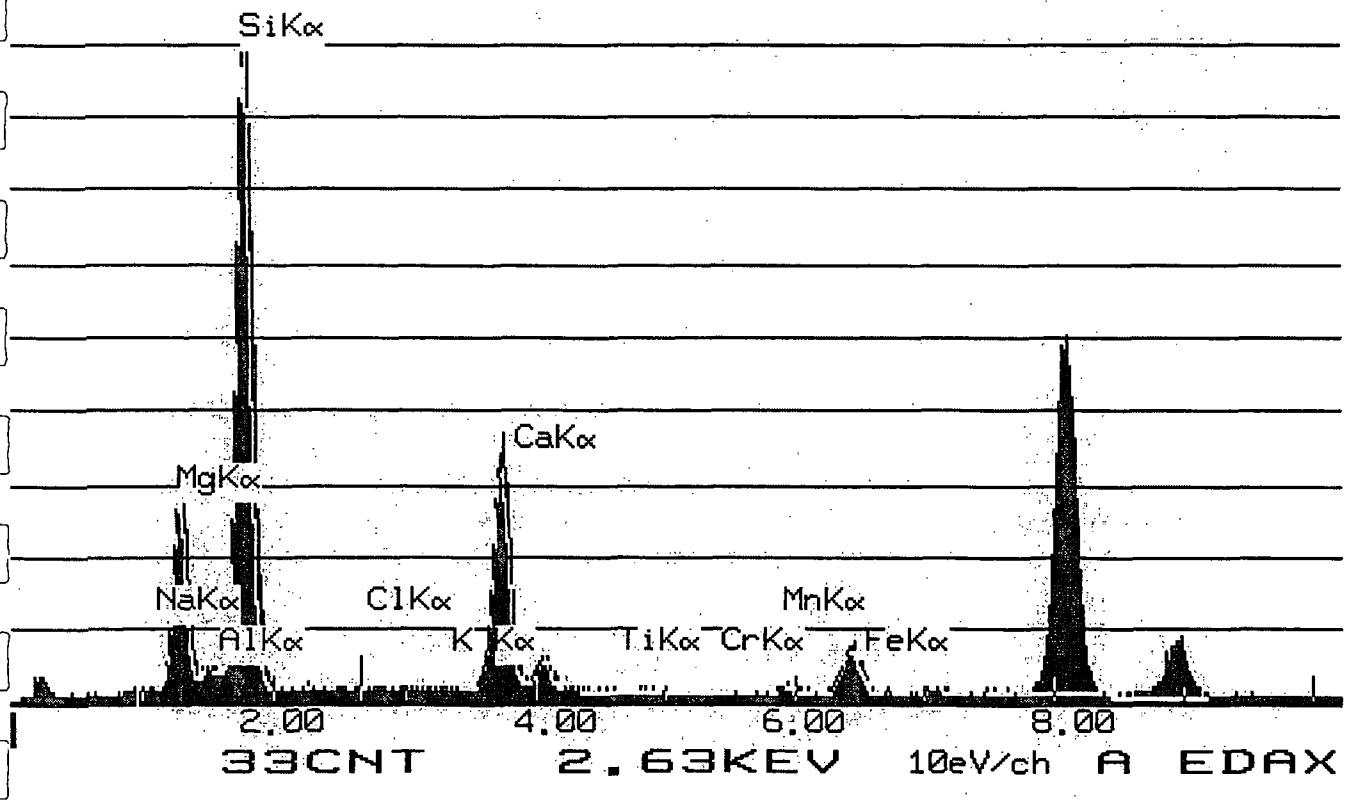


INTE-% :
LABEL = 041191-65 15291
11-JAN-73 00:07:45
42.102 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	96.718	13.365	22.161
ALK	9.976	0.828	1.565
SIK	342.099	26.589	56.882
CAK	140.778	10.432	14.596
MNK	3.183	0.340	0.439
FEK	30.949	3.047	4.356
TOTAL			100.000

USED PEIF: USER

10-JAN-05 00:08:13 SUPER QUANT
RATE= 15CPS TIME= 42LSEC
FS= 1495/ 1495 PRST= 200LSEC
A =041191-65 15291



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	56.882	Si+4	7.7295	7.7295							
Al2O3	1.565	Al+3	0.2506	0.2506	0.0000						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	4.356	Fe+3	0.0134			0.0134	0.0000				
MgO	22.161	Mg+2	4.4894			4.4894	0.0000				
MnO	0.439	Fe+2	0.4801			0.4801	0.0000				
CaO	14.596	Mn+2	0.0505			0.0171	0.0334				
Na2O	0	Ca+2	2.1249					1.9666	0.1583		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	99.999		Excess	T site	0.0000	C site	0.0334	B site	0.1583177	A site	0
			Total	7.9802		5.0000		1.9666		0.0000	0.0000
			%Fill	99.752		100		98.3281			

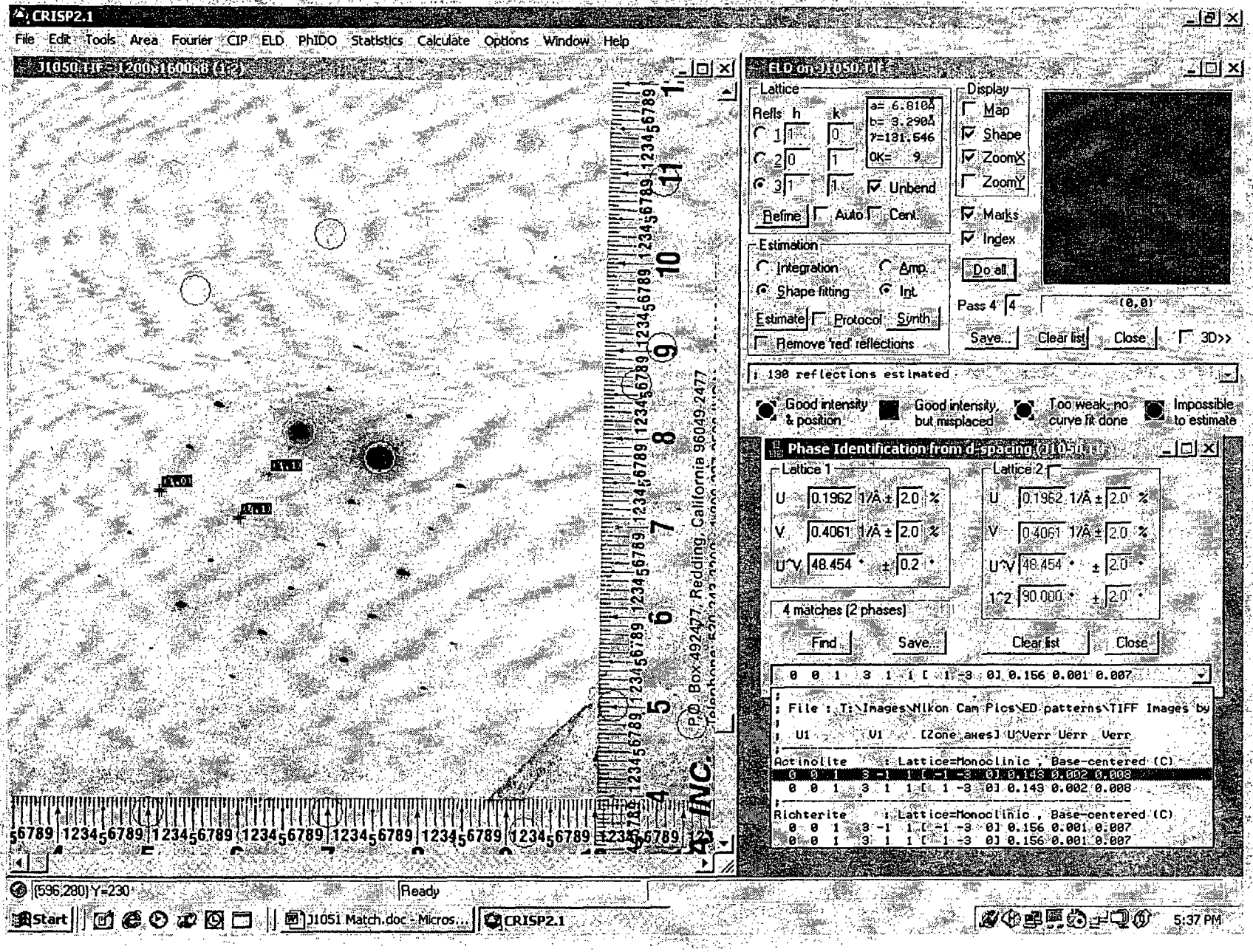
Prefix	none
Name	tremolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-65-15291

Values		Satisfied Conditions
(Ca,Na)@B	1.97	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.97	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.90	(Mg/(Mg+Fe2))>= 0.9
Si	7.73	

Mineral Analysis Program (Version 5.0)

Neg # J1050, Sample #041191-78
ACTINOLITE
[1 3 0]



QUANT: QUANTIFY
Standardless Analysis

Ratio _ALK' _ALK" _NAK' _NAK"
Ratio _FEK" _NAK _K K'
Ratio _MAK'
Chi-sqrd = 2.22

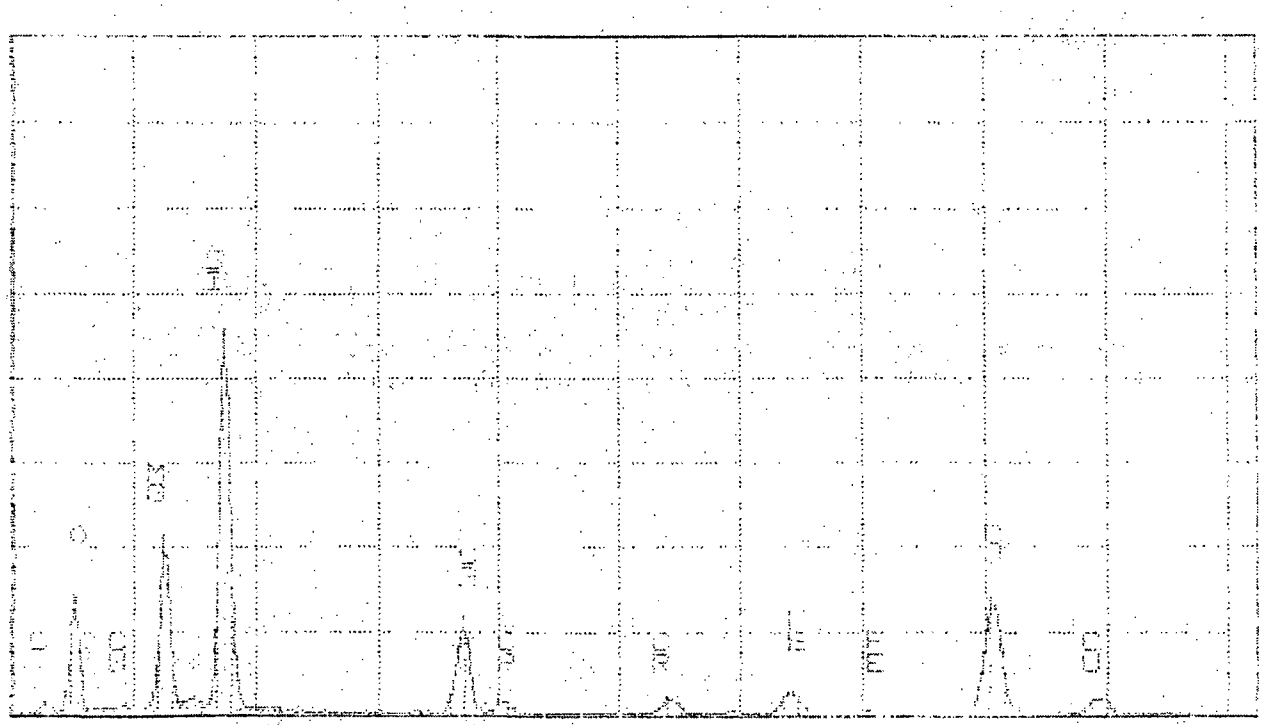
Element	Net Counts
Si-K	12624 +/- 157
Mg-K	5105 +/- 120
Al-K	224 +/- 73
Ca-K	4070 +/- [illegible]
Fe-K	1163 +/- 55
Na-K	0 +/- 0
K-K	80 +/- 29

K K	REF.S	CDW:SIK	CDW:MGK	EDW:ALK	CDW:CAK	CDW:FEK	CDW:NAK

041191-70 STMP/A

EL LINE	PEAK	K-FACTOR	CEL/LREF	ATOM%	EL WT%	WT%	FORMULA
SI-K	12624	1.000	1.000	21.85	28.97	61.87	SIO2
MG-K	5105	1.000	0.404	10.91	13.44	14.46	MGO
AL-K	224	0.750	0.010	0.30	0.36	0.73	AL2O3
CA-K	4070	0.949	0.106	2.69	3.14	4.39	CAO
FE-K	1163	1.099	0.154	1.91	3.72	5.32	FE2O3
NA-K	0	0.549	0.000	0.00	0.00	0.00	NA2O
K-K	80	1.659	0.007	0.13	0.20	0.24	K2O
O			1.600	64.30	46.10		

TN-5500 University of Washington / TFOL SHT 20-MAY-04 131935
Cursor: 0.000 keV = 0



0.000 VHS = 20.48 LD: 240

Z1 041191-70 STMP/A

1.00

	Wt Percent		Ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	61.87	Si+4	8.0000	8.0000							
Al2O3	0.73	Al+3	0.1423	0.0000	0.1423						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	5.32	Fe+3	0.0227			0.0227	0.0000				
MgO	19.46	Mg+2	3.9500			3.9500	0.0000				
MnO	0	Fe+2	0.6278			0.6278	0.0000				
CaO	12.38	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.8238					1.8238	0.0000		
K2O	0.24	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0704							0.0704	0.0000
Total	100		Excess	T site	0.1423	C site	0.0000	B site	0	A site	0
			Total	8		4.7429		1.8238		0.0704	0.0000
			%Fill	100		94.857		91.191			

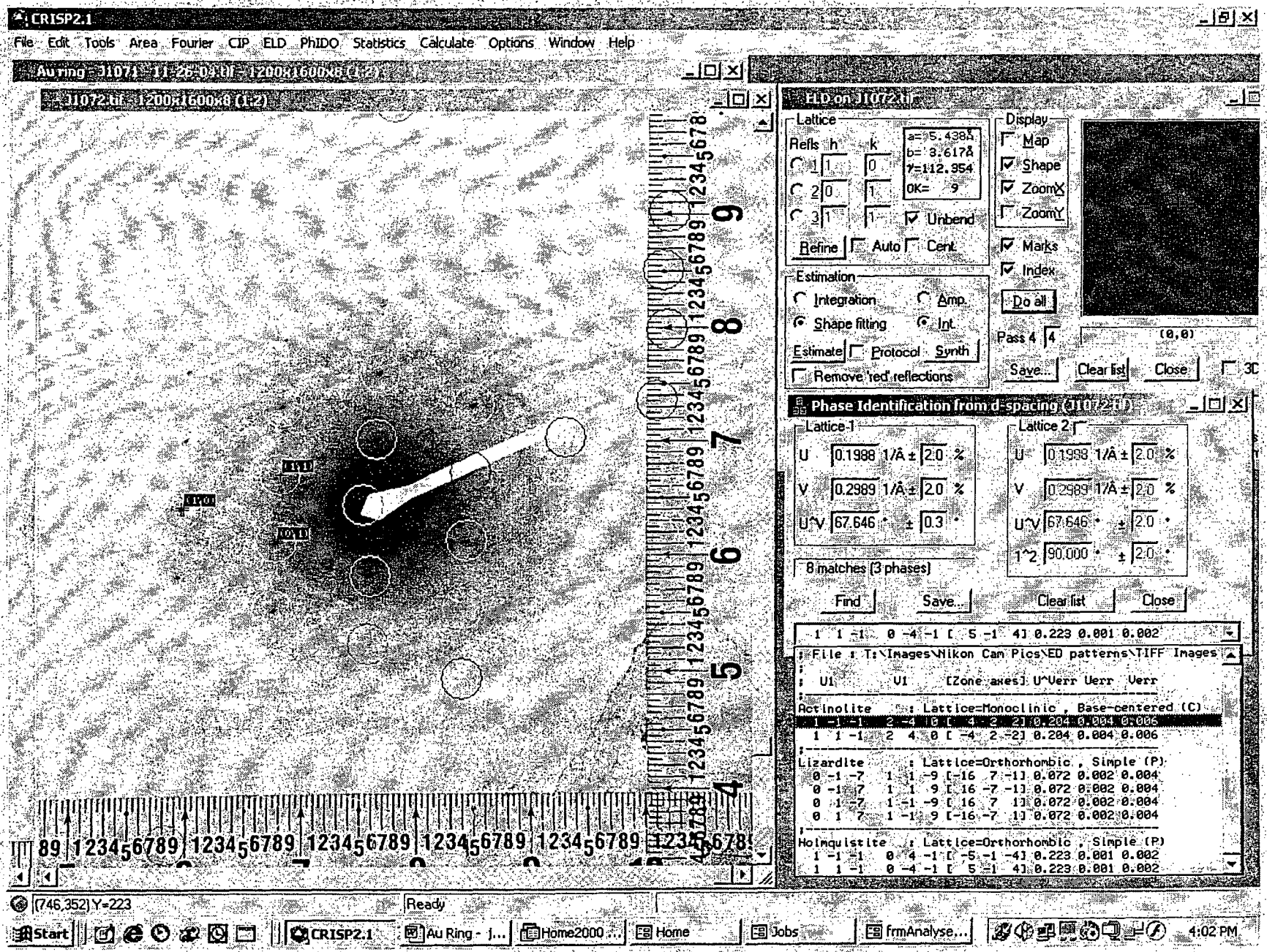
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-78-778

Values		Satisfied Conditions
(Ca,Na)@B	1.82	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.82	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.07	Si > 7.5
Mg/(Mg+Fe2)	0.86	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

Neg # J1072, Sample #041191-83
ACTINOLITE
[2 1 1]

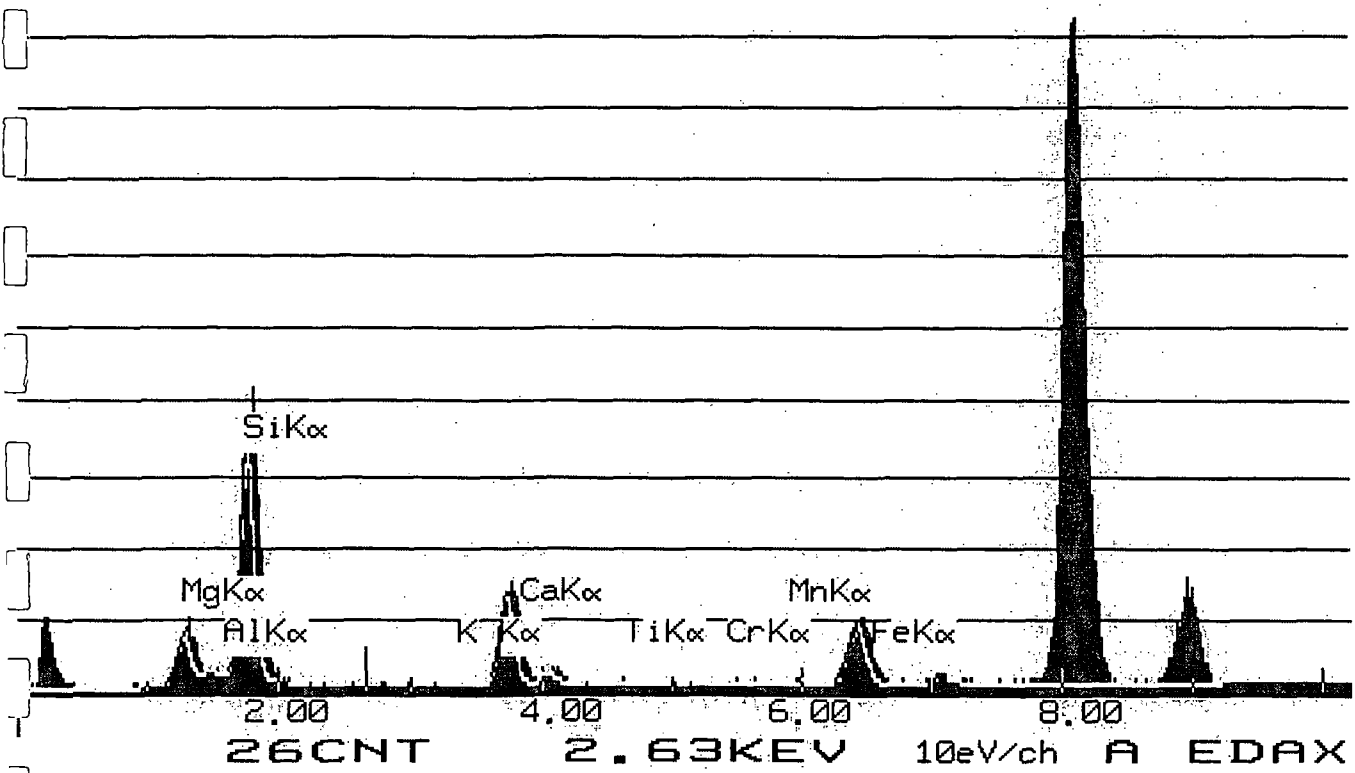


INTE-% :
LABEL = 041191-83 SP 15375
16-NOV-72 18:54:19
36.928 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	51.505	8.643	14.331
SIK	274.696	25.925	55.462
CAK	114.601	10.312	14.428
MNK	0.677	0.088	0.113
FEK	91.665	10.957	15.665
TOTAL			100.000

USED PEIF: USER

15-NOV-04 18:54:52 SUPER QUANT
RATE= 46CPS TIME= 37LSEC
FS= 2876/ 2876 PRST= 200LSEC
A =041191-83 SP 15375



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	55.462	Si+4	7.9238	7.9238							
Al2O3	0	Al+3	0.0000	0.0000	0.0000						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	15.665	Fe+3	0.0168			0.0168	0.0000				
MgO	14.331	Mg+2	3.0524			3.0524	0.0000				
MnO	0.113	Fe+2	1.8527			1.8527	0.0000				
CaO	14.428	Mn+2	0.0137			0.0137	0.0000				
Na2O	0	Ca+2	2.2083					2.0000	0.2083		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	99.999		Excess	T site	0.0000	C site	0.0000	B site	0.2083437	A site	0
			Total	7.9238		4.9356		2.0000		0.0000	0.0000
			%Fill	99.048		98.7123		100			

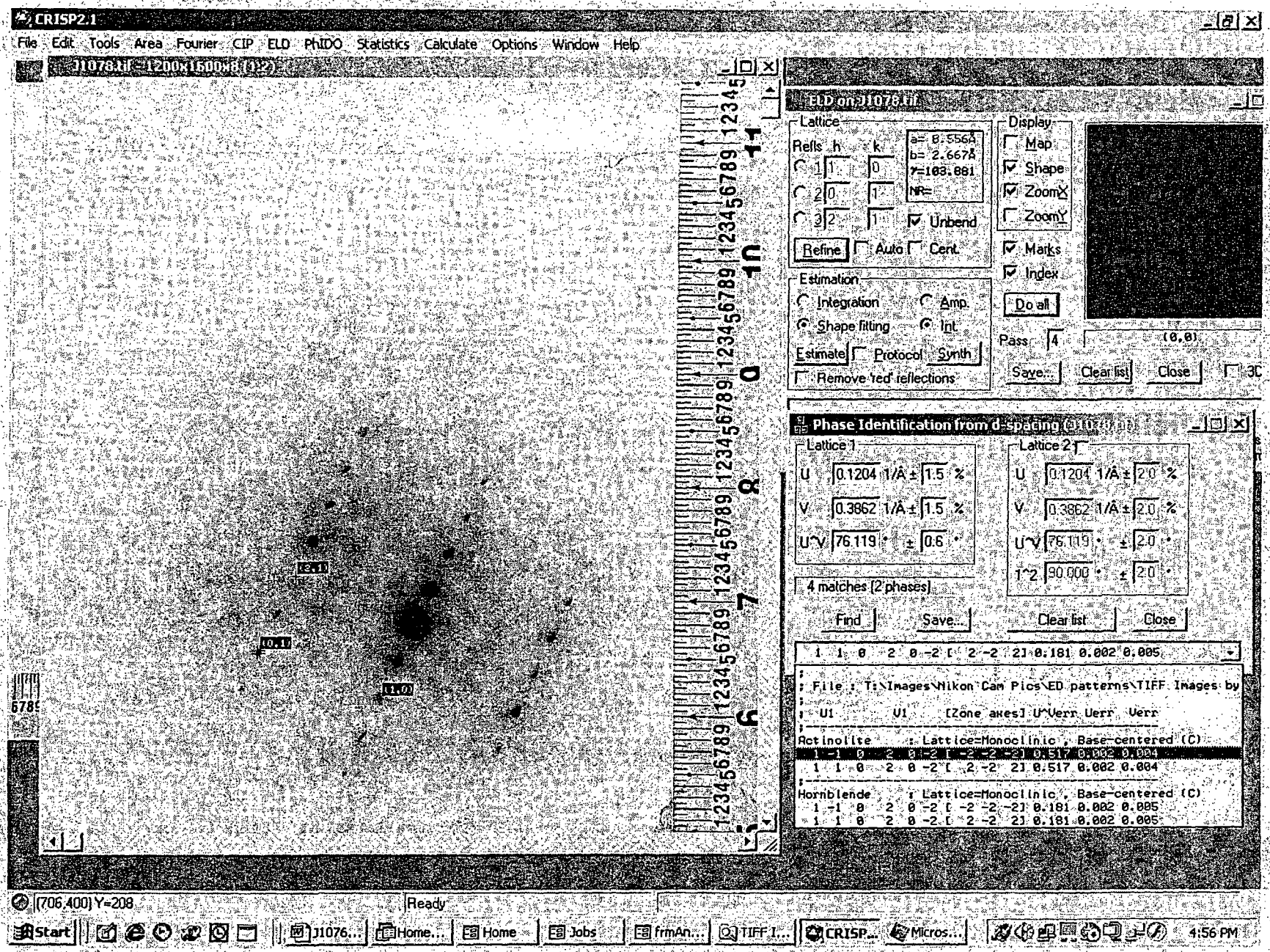
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-83-15375

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.62	(Mg/(Mg+Fe2))< 0.9
Si	7.92	

Mineral Analysis Program (Version 5.0)

Neg # J1078, Sample #041191-103
ACTINOLITE
[1 1 1]

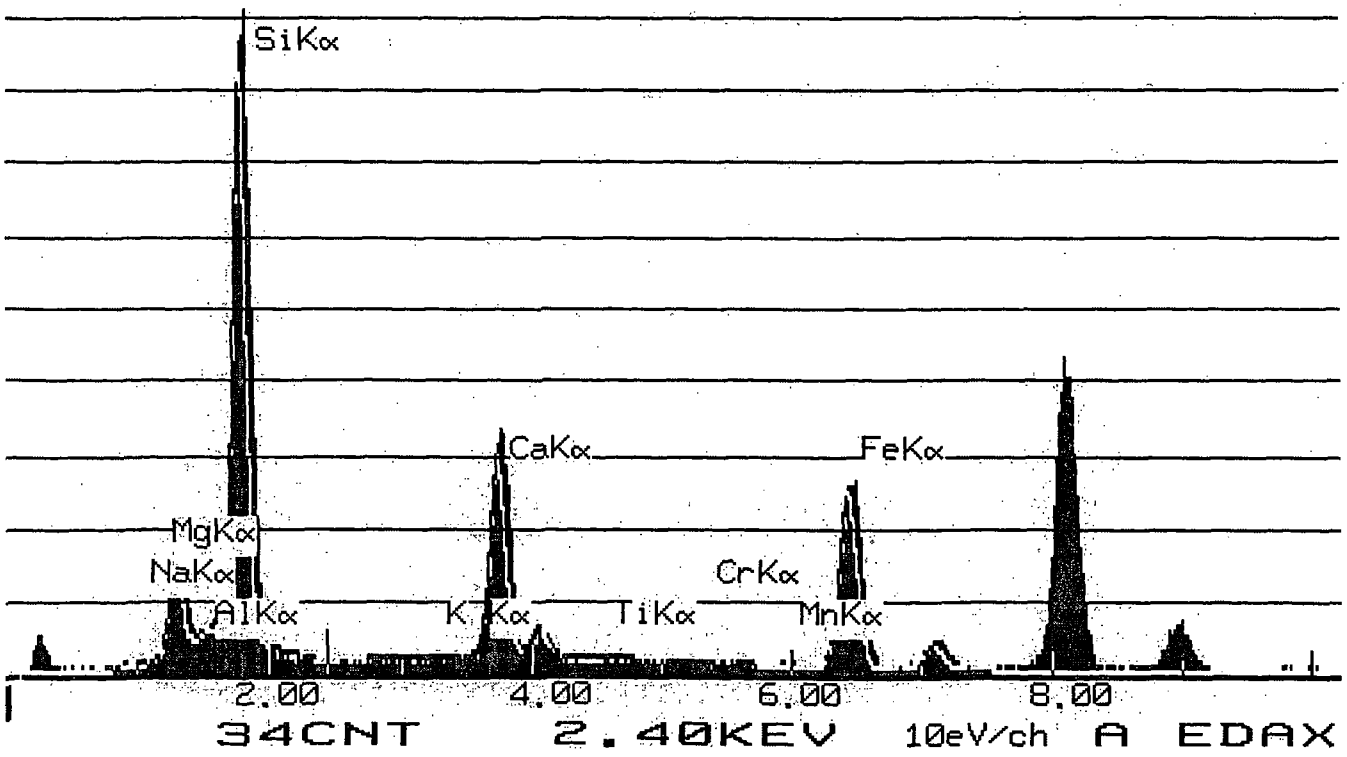


INTE-% :
LABEL = 041191-103 15400
22-NOV-72 03:47:15
20.061 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	124.022	7.675	12.725
ALK	6.779	0.252	0.476
SIK	735.960	25.614	54.797
CAK	288.671	9.579	13.402
MNK	1.745	0.084	0.108
FEK	293.407	12.933	18.491
TOTAL			100.000

USED PEIF: USER

21-NOV-04 03:47:32 SUPER QUANT
RATE= 190CPS TIME= 20LSEC
FS= 1779/ 1779 PRST= 200LSEC
A =041191-103 15400



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.797	Si+4	7.9081	7.9081							
Al2O3	0.476	Al+3	0.0810	0.0810	0.0000						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	18.491	Fe+3	0.0201			0.0201	0.0000				
MgO	12.725	Mg+2	2.7378			2.7378	0.0000				
MnO	0.108	Fe+2	2.2091			2.2091	0.0000				
CaO	13.402	Mn+2	0.0132			0.0132	0.0000				
Na2O	0	Ca+2	2.0721					2.0000	0.0721		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	99.999		Excess	T site	0.0000	C site	0.0000	B site	0.0720902	A site	0
			Total	7.9891		4.9802		2.0000		0.0000	0.0000
			%Fill	99.864		99.6034		100			

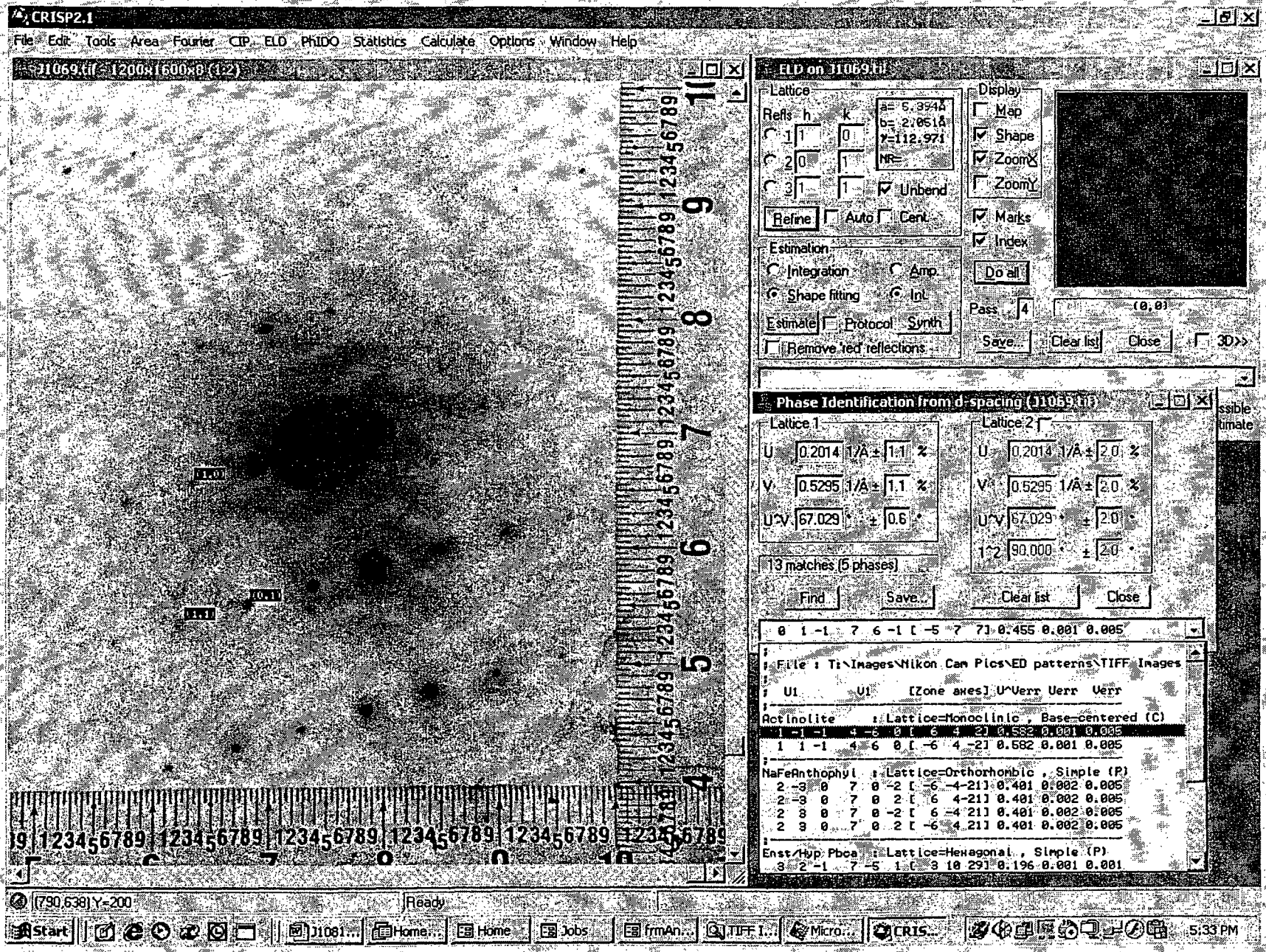
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-103-15400

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.55	(Mg/(Mg+Fe2))< 0.9
Si	7.91	

Mineral Analysis Program (Version 5.0)

Neg # J1069, Sample #041191-110
ACTINOLITE
[3 2 1]



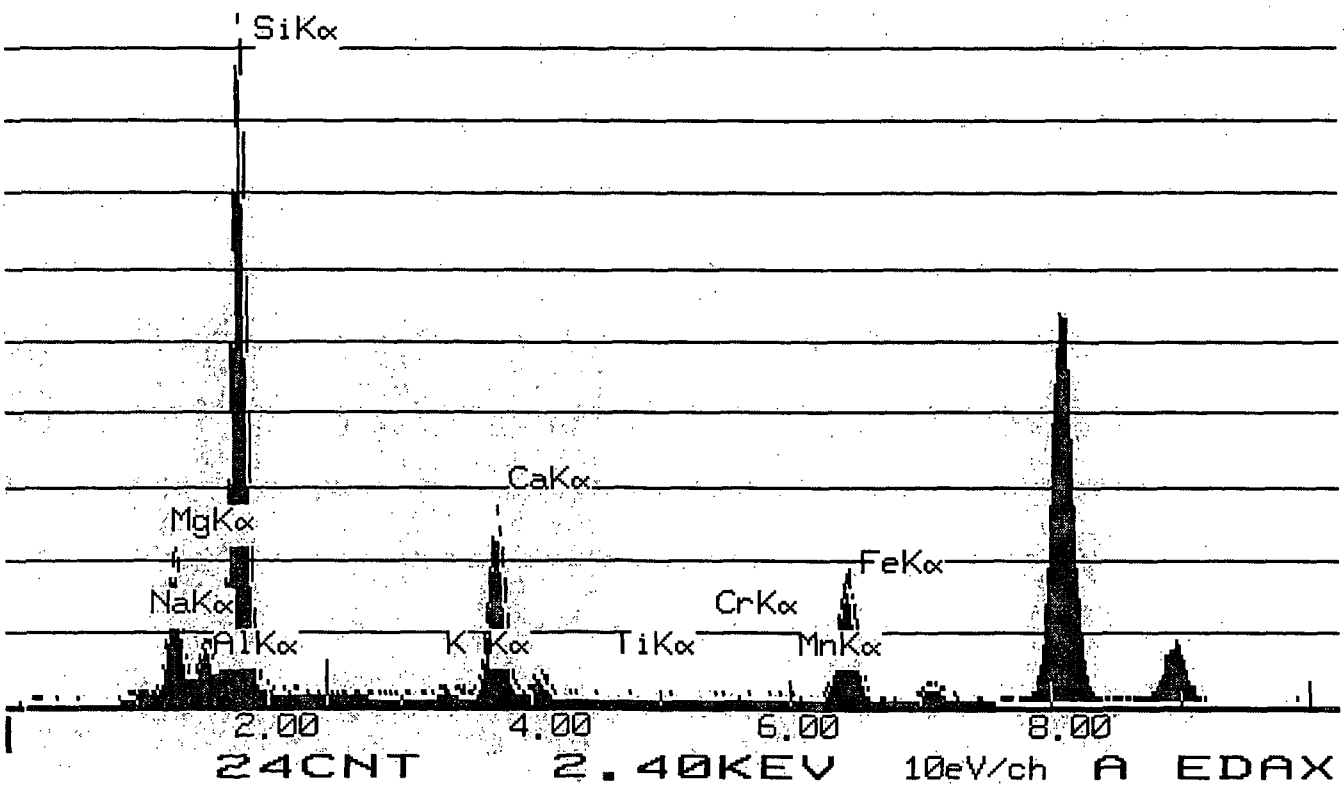
INTE-% :
LABEL = 041191-110 15410
23-NOV-72 05:21:42
147.664 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	23.791	9.586	15.894
ALK	7.646	1.850	3.496
SIK	117.057	26.526	56.749
K K	1.903	0.717	0.863
CAK	37.071	8.009	11.207
TIK	0.420	0.128	0.213
CRK	0.291	0.088	0.128
MNK	0.684	0.213	0.275
FEK	27.231	7.816	11.174
TOTAL			100.000

USED PEIF: USER

Bb-dust
Actinolite

22-NOV-04 05:23:26 SUPER QUANT
RATE=25841CPS TIME= 148LSEC
FS= 1863/ 1863 PRST= 200LSEC
A =041191-110 15410



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	56.749	Si+4	7.8391	7.8391							
Al2O3	3.496	Al+3	0.5691	0.1609	0.4083						
TiO2	0.213	Ti+4	0.0221	0.0000	0.0221						
Cr2O3	0.128	Cr+3	0.0140			0.0140	0.0000				
Fe(total)O	11.174	Fe+3	0.1858			0.1858	0.0000				
MgO	15.894	Mg+2	3.2732			3.2732	0.0000				
MnO	0.275	Fe+2	1.0842			1.0842	0.0000				
CaO	11.207	Mn+2	0.0322			0.0125	0.0197				
Na2O	0	Ca+2	1.6585					1.6585	0.0000		
K2O	0.863	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.1521							0.1521	0.0000
Total	99.999		Excess	T site	0.4304	C site	0.0197	B site	0	A site	0
			Total	8		5.0000		1.6585		0.1521	0.0000
			%Fill	100		100		82.9261			

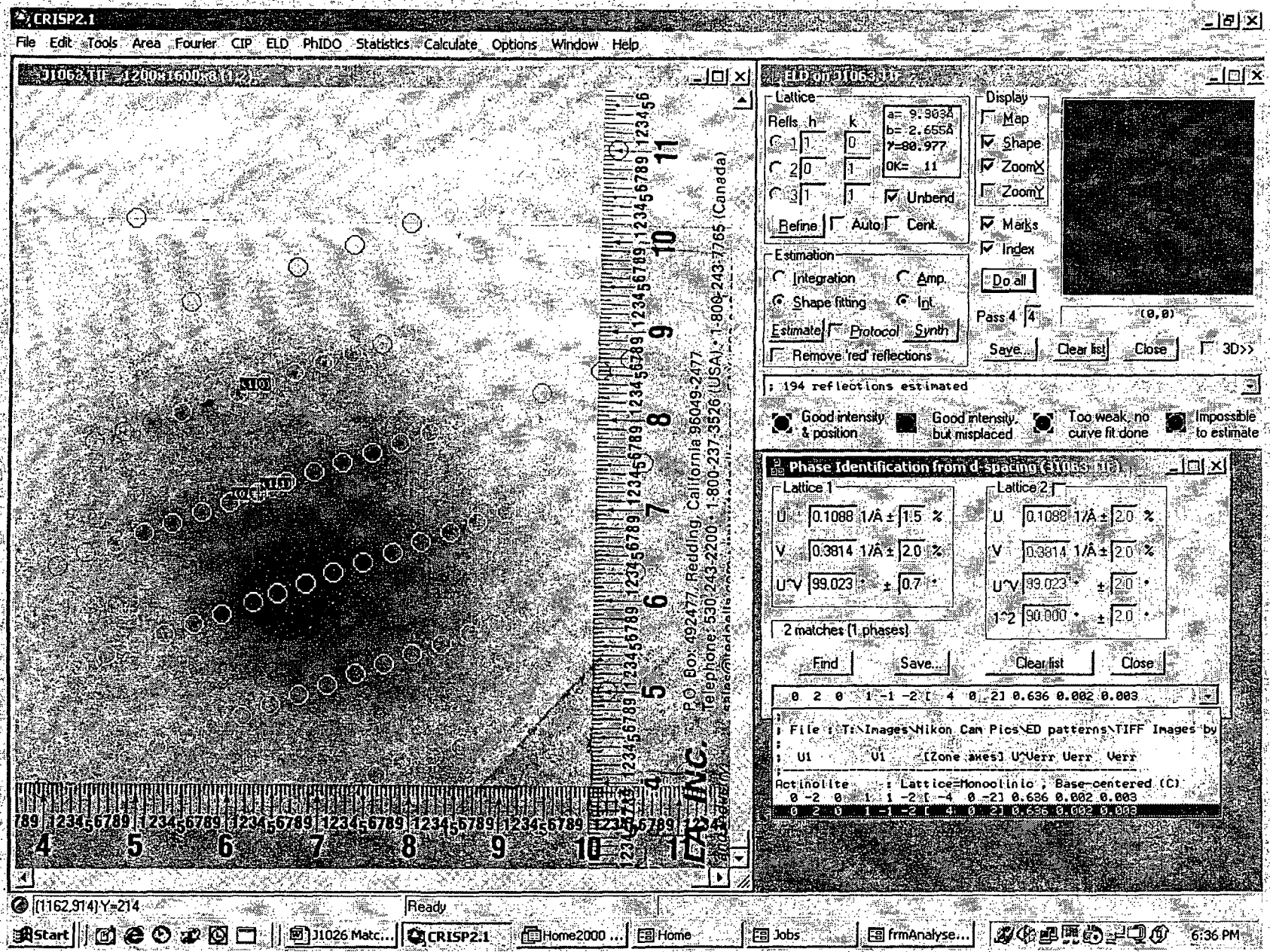
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041191-110-15410

Values		Satisfied Conditions
(Ca,Na)@B	1.66	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.66	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.15	Si > 7.5
Mg/(Mg+Fe2)	0.75	(Mg/(Mg+Fe2))< 0.9
Si	7.84	

Mineral Analysis Program (Version 5.0)

Neg # J1063, Sample #041191-116
ACTINOLITE
[2 0 1]



PANTEK QUANTIFY
Standardless Analysis

Unknown = 4.56

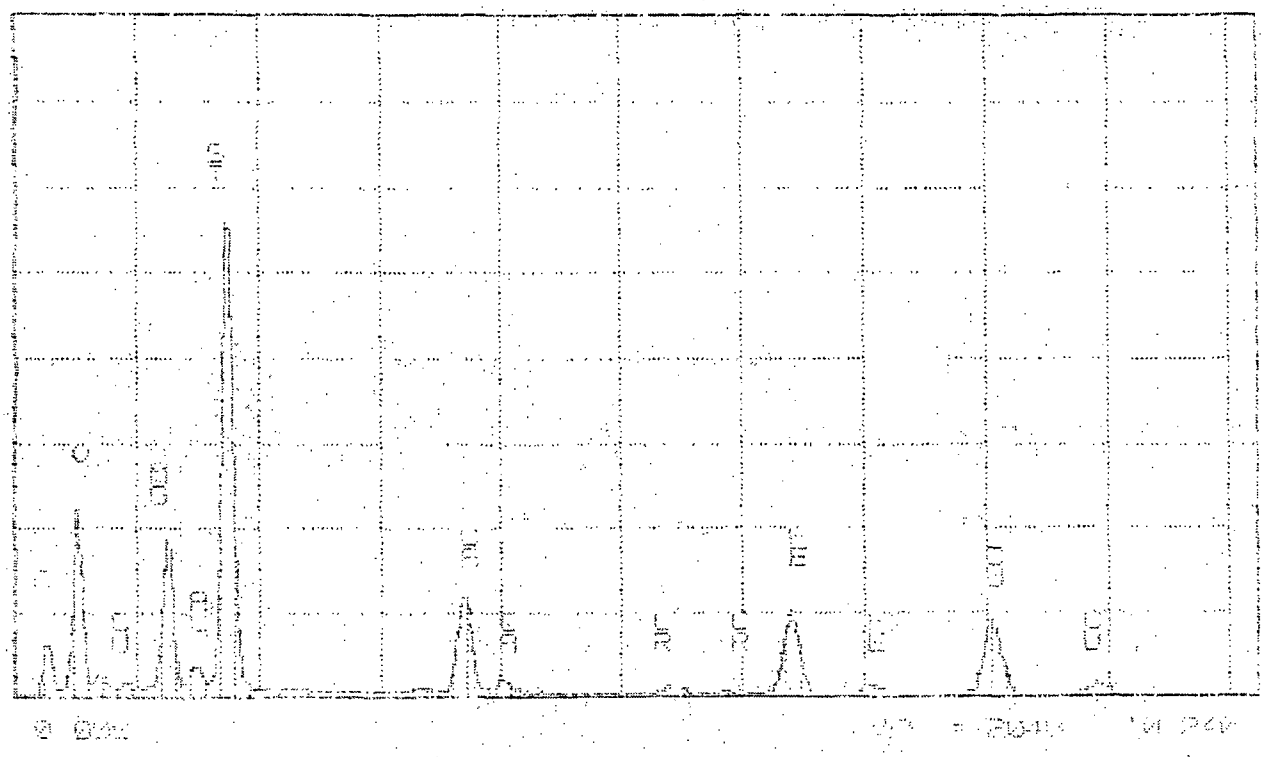
Element	Net Counts	
Si-K	17617 +/-	231
Mg-K	4469 +/-	220
Al-K	612 +/-	264
Ca-K	4732 +/-	119
Fe-K	4350 +/-	124
Na-K	146 +/-	119
K-K	158 +/-	274

PEAK: KDA:SIK KDA:MGK KDA:ALK KDA:CAK KDA:FEK KDA:NAK KDA:K

00191 11A.XP/V1

SPECTRUM	PEAK	K-FACTOR	CONC/CALC	ATOMIC %	WT %	WT%	COMPOUND
SI-K	17617	1.000	1.000	24.44	27.54	58.98	SIO2
MG-K	4469	1.000	0.198	7.18	7.61	14.01	MGO
AL-K	612	0.750	0.029	0.45	0.80	1.52	AL2O3
CA-K	4732	0.949	0.265	4.32	7.87	11.02	CAO
FE-K	4350	1.099	0.390	4.19	10.47	15.04	FEO(T)
NA-K	146	0.549	0.005	0.13	0.14	0.29	NA2O
K-K	158	1.059	0.011	0.17	0.29	0.35	K2O
O			1.649	61.93	53.08		

TN-5500 University of Washington / JEOL TUE 23-NOV-04 15:24
Current 0.000keV = 0



57 041101 11A 31/91

1.00
0.0

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	58.58	Si+4	8.0000	8.0000							
Al2O3	1.52	Al+3	0.2674	0.0000	0.2674						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	15.24	Fe+3	0.0267			0.0267	0.0000				
MgO	13.01	Mg+2	2.7567			2.7567	0.0000				
MnO	0	Fe+2	1.7894			1.7894	0.0000				
CaO	11.02	Mn+2	0.0000			0.0000	0.0000				
Na2O	0.29	Ca+2	1.6827					1.6827	0.0000		
K2O	0.35	Na+	0.1199					0.1199	0.0000	0.0000	0.0000
		K+	0.0806							0.0806	0.0000
Total	100.01		Excess	T site	0.2674	C site	0.0000	B site	0	A site	0
			Total	8		4.8402		1.8026		0.0806	0.0000
			%Fill	100		96.8041		90.1281			

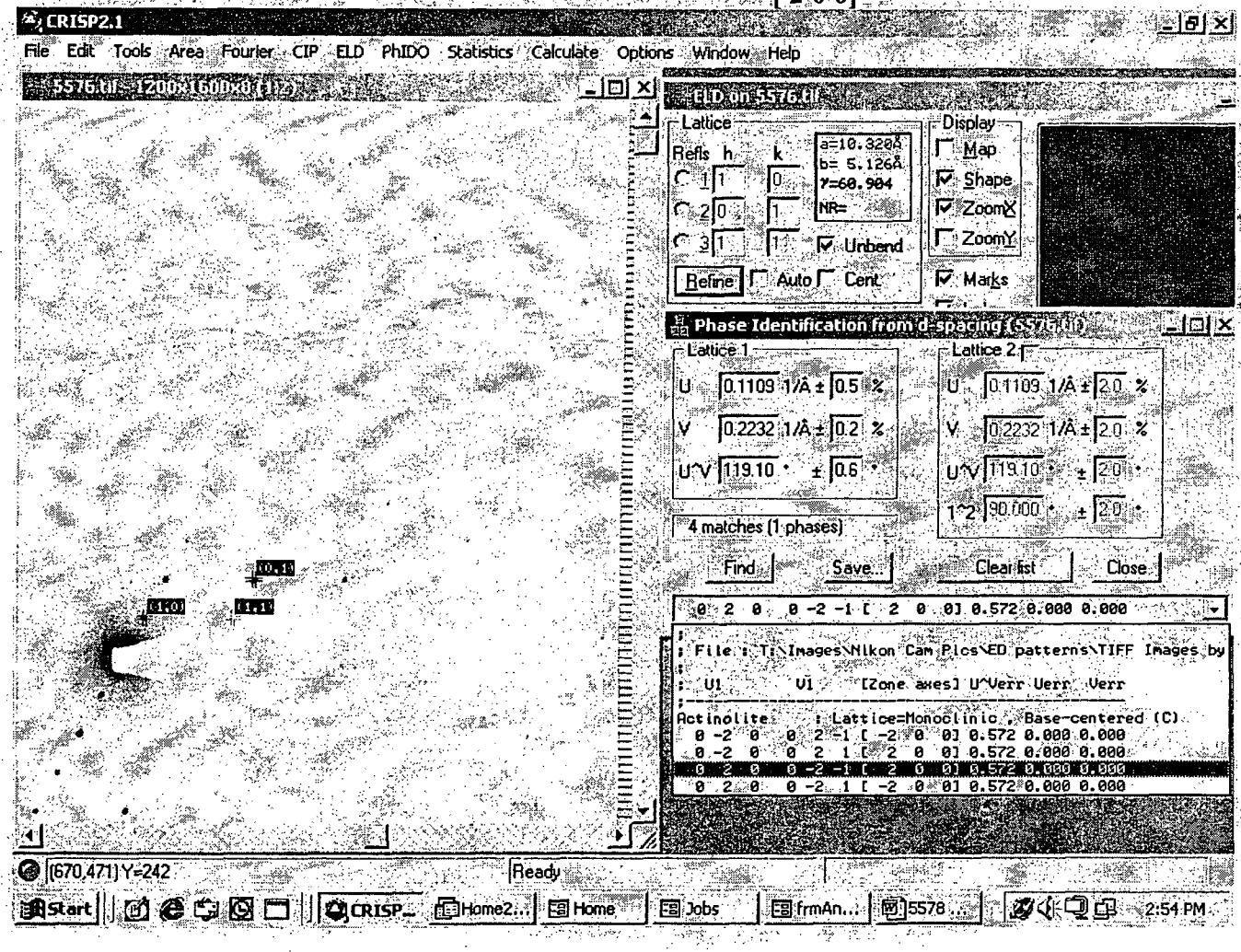
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # 041191-116-791

Values		Satisfied Conditions
(Ca,Na)@B	1.80	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.12	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.68	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.08	Si > 7.5
Mg/(Mg+Fe2)	0.61	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

NEG#5576; SAMPLE# 041210-01
ACTINOLITE
[2 0 0]

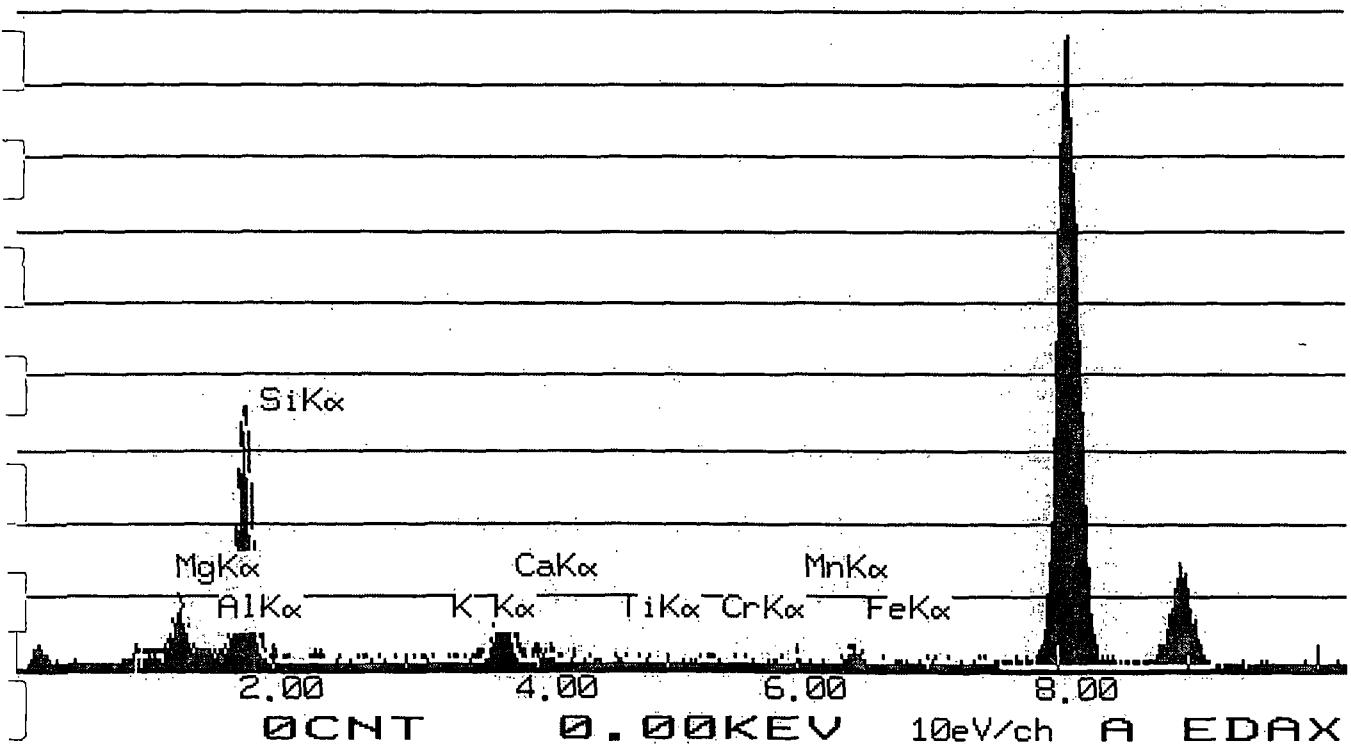


INTE-% :
LABEL = 041210-01 15436
27-NOV-72 08:41:17
130.580 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	4.235	10.724	17.781
SIK	20.815	29.644	63.420
CAK	6.517	8.849	12.382
TIK	0.100	0.191	0.318
CRK	0.176	0.333	0.486
MNK	0.322	0.630	0.814
FEK	1.861	3.357	4.799
TOTAL			100.000

USED PEIF: USER

26-NOV-04 08:41:48 SUPER QUANT
RATE= 56CPS TIME= 130LSEC
FS= 796/ 796 PRST= 200LSEC
A =041210-01 15436



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	63.42	Si+4	8.0000	8.0000							
Al2O3	0	Al+3	0.0000	0.0000	0.0000						
TiO2	0.318	Ti+4	0.0815	0.0000	0.0815						
Cr2O3	0.486	Cr+3	0.0773			0.0773	0.0000				
Fe(total)O	4.799	Fe+3	0.0296			0.0296	0.0000				
MgO	17.781	Mg+2	3.6351			3.6351	0.0000				
MnO	0.814	Fe+2	0.5852			0.5852	0.0000				
CaO	12.382	Mn+2	0.1478			0.1478	0.0000				
Na2O	0	Ca+2	1.8405					1.8405	0.0000		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100		Excess	T site	0.0815	C site	0.0000	B site	0	A site	0
			Total	8		4.5566		1.8405		0.0000	0.0000
			%Fill	100		91.133		92.0266			

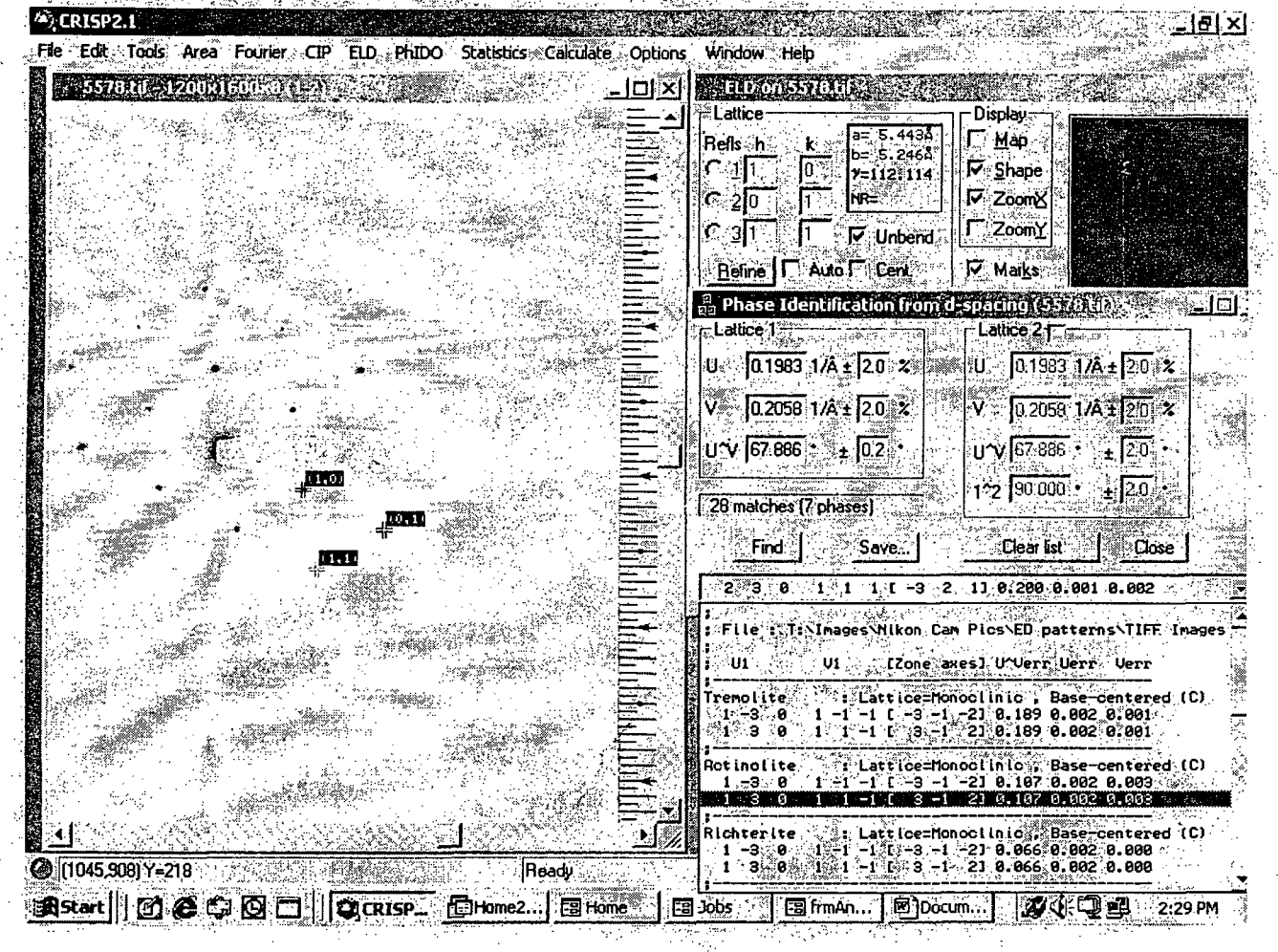
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-01-15436

Values		Satisfied Conditions
(Ca,Na)@B	1.84	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.84	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.86	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

NEG#5578; SAMPLE# 041210-01
ACTINOLITE
[3 -1 2]

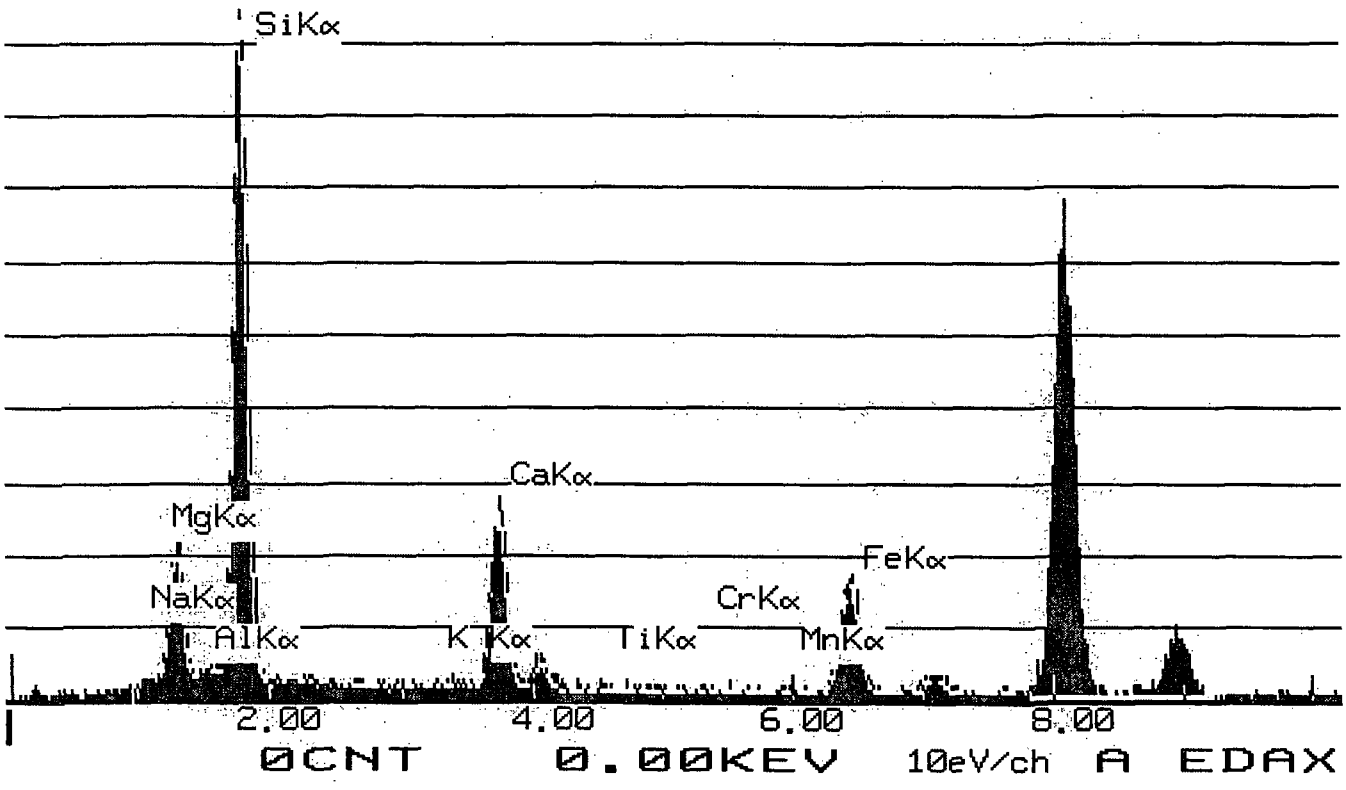


INTE-% :
LABEL = 041210-01 15438
27-NOV-72 09:39:50
63.311 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	17.959	10.114	16.770
ALK	1.548	0.524	0.989
SIK	87.268	27.642	59.135
K K	0.363	0.191	0.230
CAK	27.594	8.333	11.660
TIK	0.190	0.081	0.135
FEK	19.317	7.750	11.080
TOTAL			100.000

USED PEIF: USER

26-NOV-04 09:40:21 SUPER QUANT
RATE= 20CPS TIME= 63LSEC
FS= 589/ 589 PRST= 200LSEC
A =041210-01 15438



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	59.135	Si+4	8.0000	8.0000							
Al2O3	0.989	Al+3	0.1715	0.0000	0.1715						
TiO2	0.135	Ti+4	0.0283	0.0000	0.0283						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	11.08	Fe+3	0.0416			0.0416	0.0000				
MgO	16.77	Mg+2	3.4671			3.4671	0.0000				
MnO	0	Fe+2	1.2520			1.2520	0.0000				
CaO	11.66	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.7385					1.7385	0.0000		
K2O	0.23	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0525							0.0525	0.0000
Total	99.999		Excess	T site	0.1999	C site	0.0000	B site	0	A site	0
			Total	8		4.9605		1.7385		0.0525	0.0000
			%Fill	100		99.211		86.9272			

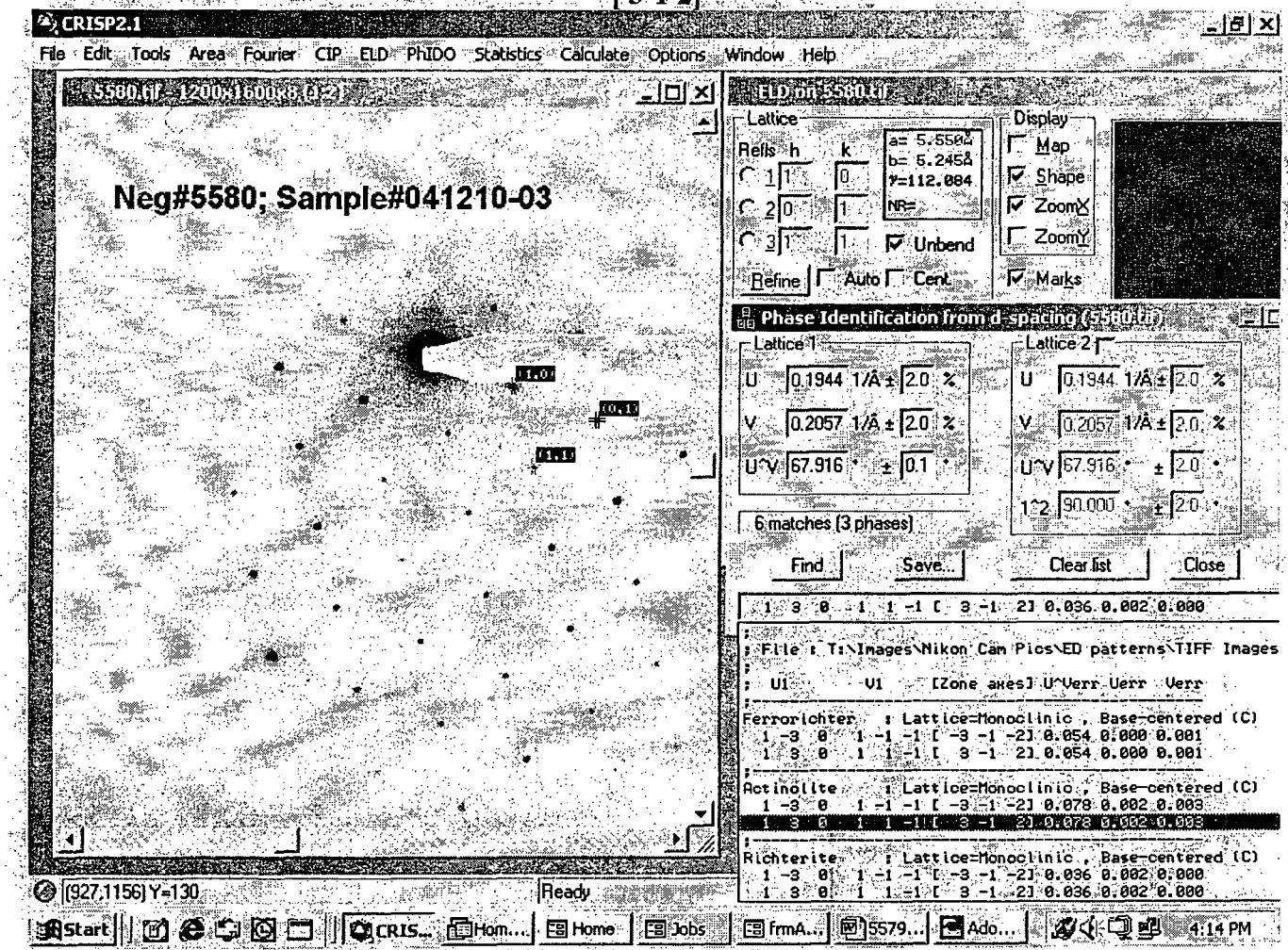
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-01-15438

Values		Satisfied Conditions
(Ca,Na)@B	1.74	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.74	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.05	Si > 7.5
Mg/(Mg+Fe2)	0.73	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

NEG#5580; SAMPLE# 041210-03
ACTINOLITE
[3-1 2]



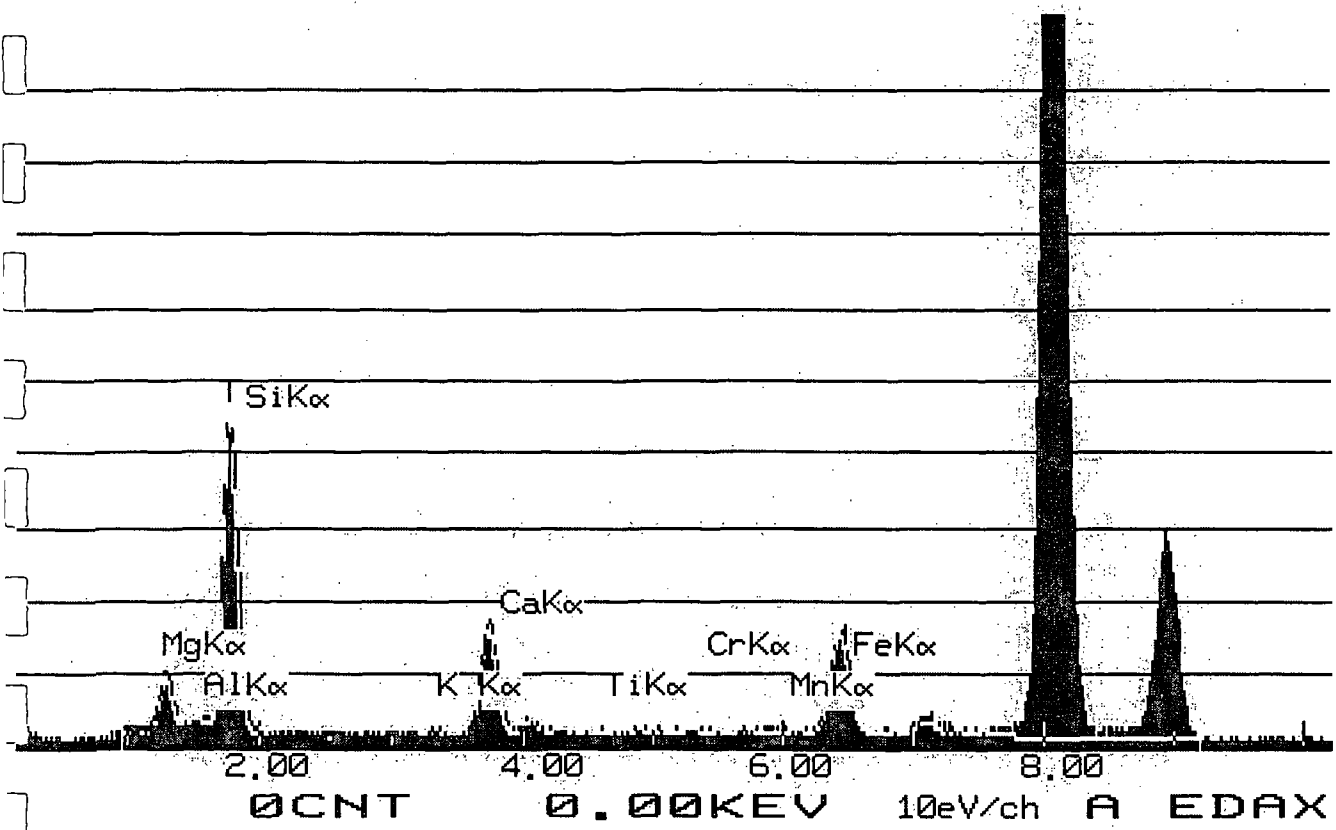
NTE-% :
ABEL = 041210-03 15440
27-NOV-72 11:13:10
75.213 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	11.727	7.054	11.696
ALK	3.244	1.172	2.215
SIK	74.229	25.113	53.725
CAK	29.237	9.431	13.195
MNK	0.479	0.223	0.288
FEK	30.819	13.206	18.881

TOTAL			100.000

USED PEIF: USER

6-NOV-04 11:13:35 SUPER QUANT
RATE= 8CPS TIME= 75LSEC
S= 1221/ 1221 PRST= 200LSEC
=041210-03 15440



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	53.725	Si+4	7.7703	7.7703							
Al2O3	2.215	Al+3	0.3775	0.2297	0.1478						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	18.881	Fe+3	0.0205			0.0205	0.0000				
MgO	11.696	Mg+2	2.5219			2.5219	0.0000				
MnO	0.288	Fe+2	2.2606			2.2606	0.0000				
CaO	13.195	Mn+2	0.0353			0.0353	0.0000				
Na2O	0	Ca+2	2.0445					2.0000	0.0445		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100		Excess	T site	0.1478	C site	0.0000	B site	0.0445245	A site	0
			Total	8		4.9861		2.0000		0.0000	0.0000
			%Fill	100		99.7227		100			

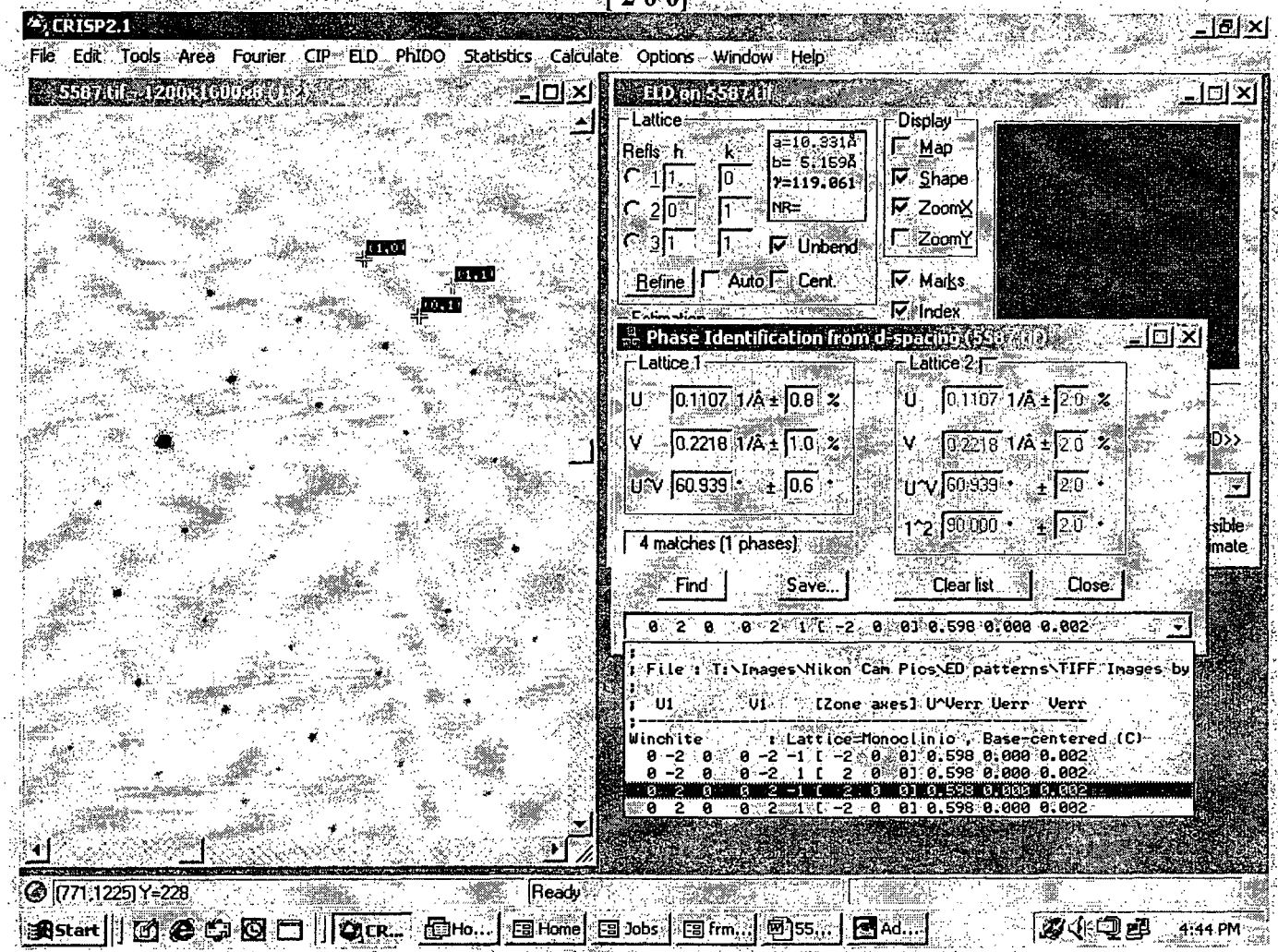
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-03-15440

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.53	(Mg/(Mg+Fe2))< 0.9
Si	7.77	

Mineral Analysis Program (Version 5.0)

NEG#5587; SAMPLE# 041210-07
WINCHITE
[2 0 0]



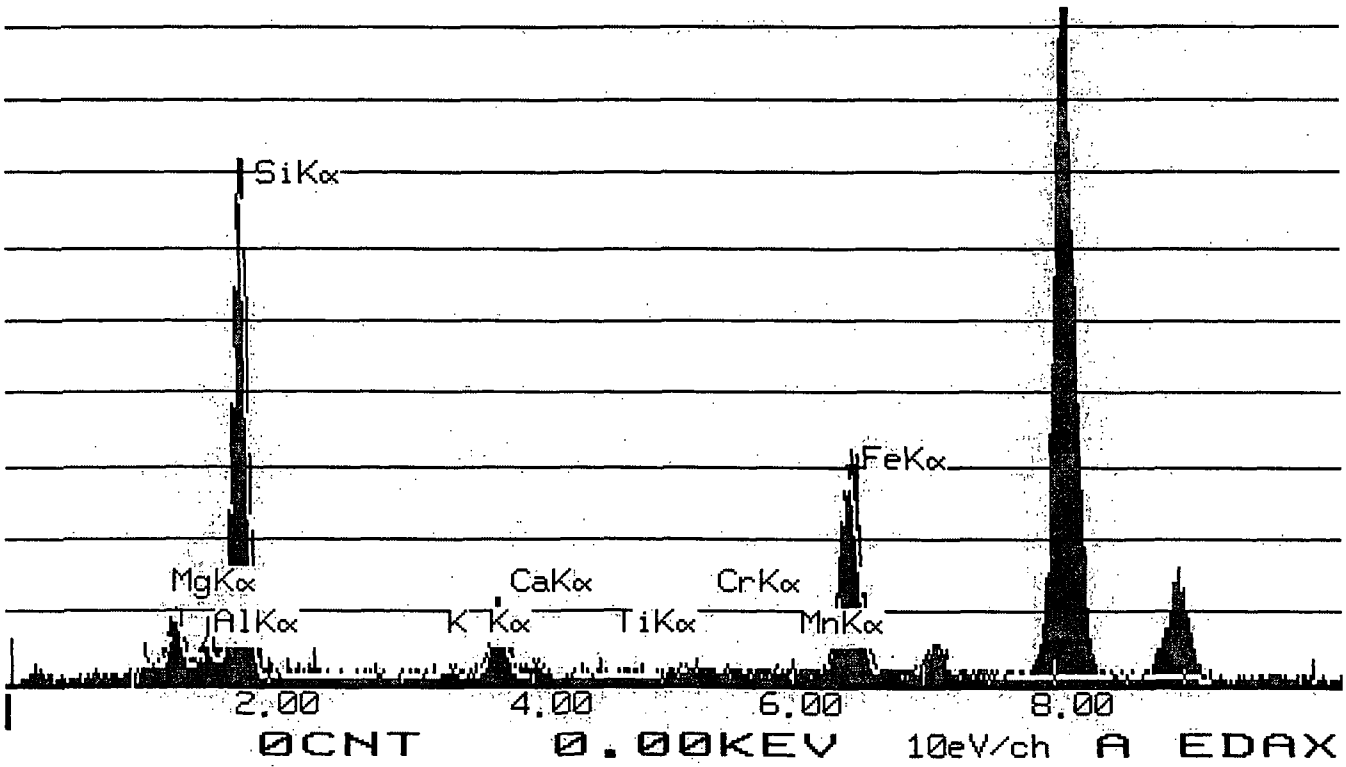
INTE-% :
LABEL = 041210-07 15443
28-NOV-72 00:29:33
30.351 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
NAK	1.977	2.016	2.717
MGK	10.906	5.250	8.706
ALK	5.634	1.629	3.079
SIK	94.460	25.577	54.719
K K	1.186	0.534	0.643
CAK	14.629	3.777	5.284
TIK	0.329	0.120	0.200
FEK	50.278	17.243	24.652

TOTAL			100.000

USED PEIF: USER

27-NOV-04 00:30:01 SUPER QUANT
RATE=*****CPS TIME= 30LSEC
FS= 398/ 398 PRST= 200LSEC
A =041210-07 15443



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.719	Si+4	7.8199	7.8199							
Al2O3	3.079	Al+3	0.5186	0.1801	0.3385						
TiO2	0.2	Ti+4	0.0215	0.0000	0.0215						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	24.652	Fe+3	1.2724			1.2724	0.0000				
MgO	8.706	Mg+2	1.8548			1.8548	0.0000				
MnO	0	Fe+2	1.5319			1.5128	0.0191				
CaO	5.284	Mn+2	0.0000			0.0000	0.0000				
Na2O	2.717	Ca+2	0.8090					0.8090	0.0000		
K2O	0.643	Na+	0.7528					0.7528	0.0000	0.0000	0.0000
		K+	0.1172							0.1172	0.0000
Total	100		Excess	T site	0.3600	C site	0.0191	B site	0	A site	0
			Total	8		5.0000		1.5618		0.1172	0.0000
			%Fill	100		100		78.0883			

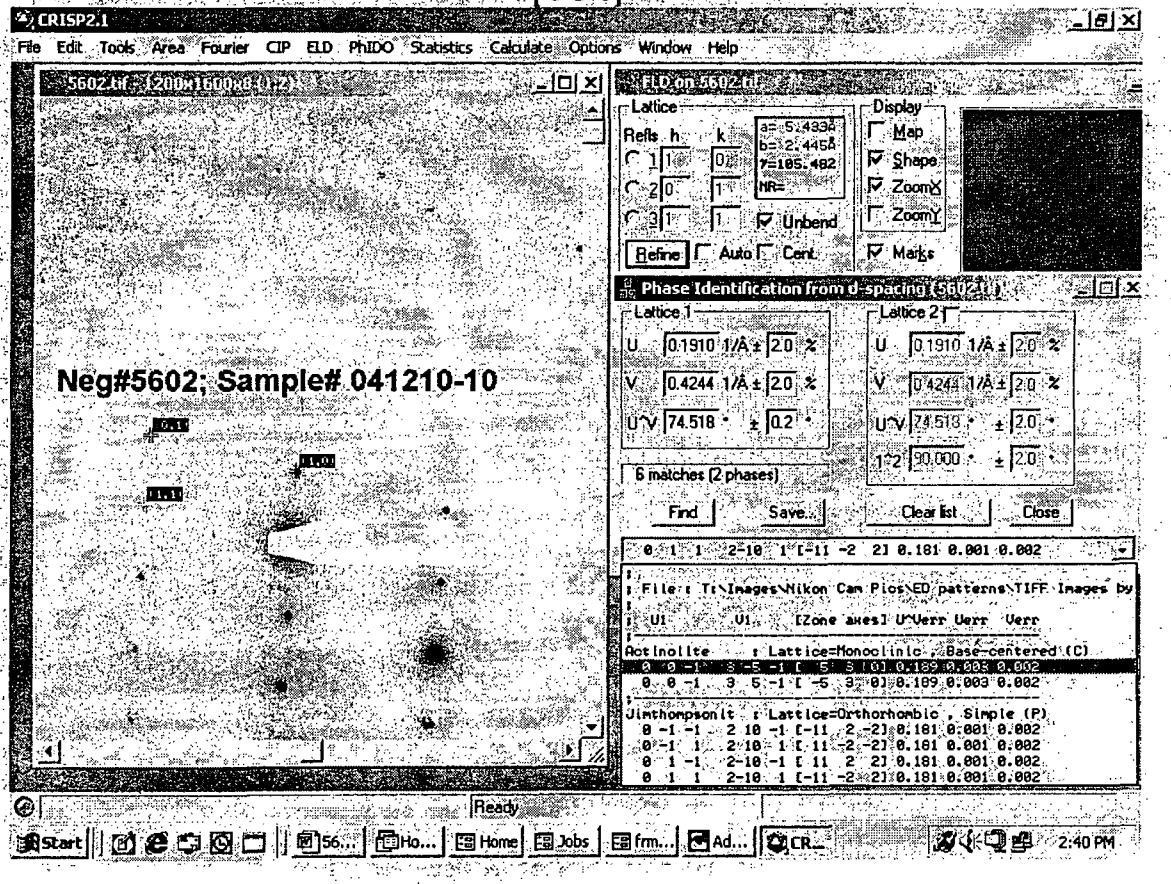
Prefix Ferri
Name winchite
Modifier none
Group Sodic-Calcic Amphibole

Sample # 041210-07-15443

Values		Satisfied Conditions
(Ca,Na)@B	1.56	(Ca,Na)@B >= 1 and 0.5 <= Na@B < 1.5
Na@B	0.75	(Na,K)@A < 0.5
Na,K)@A	0.12	(Mg/(Mg+Fe2))>= 0.5
Mg/(Mg+Fe2)	0.55	Si > 7.5
Si	7.82	

Mineral Analysis Program (Version 5.0)

NEG#5602; SAMPLE# 041210-10
ACTINOLITE
[530]

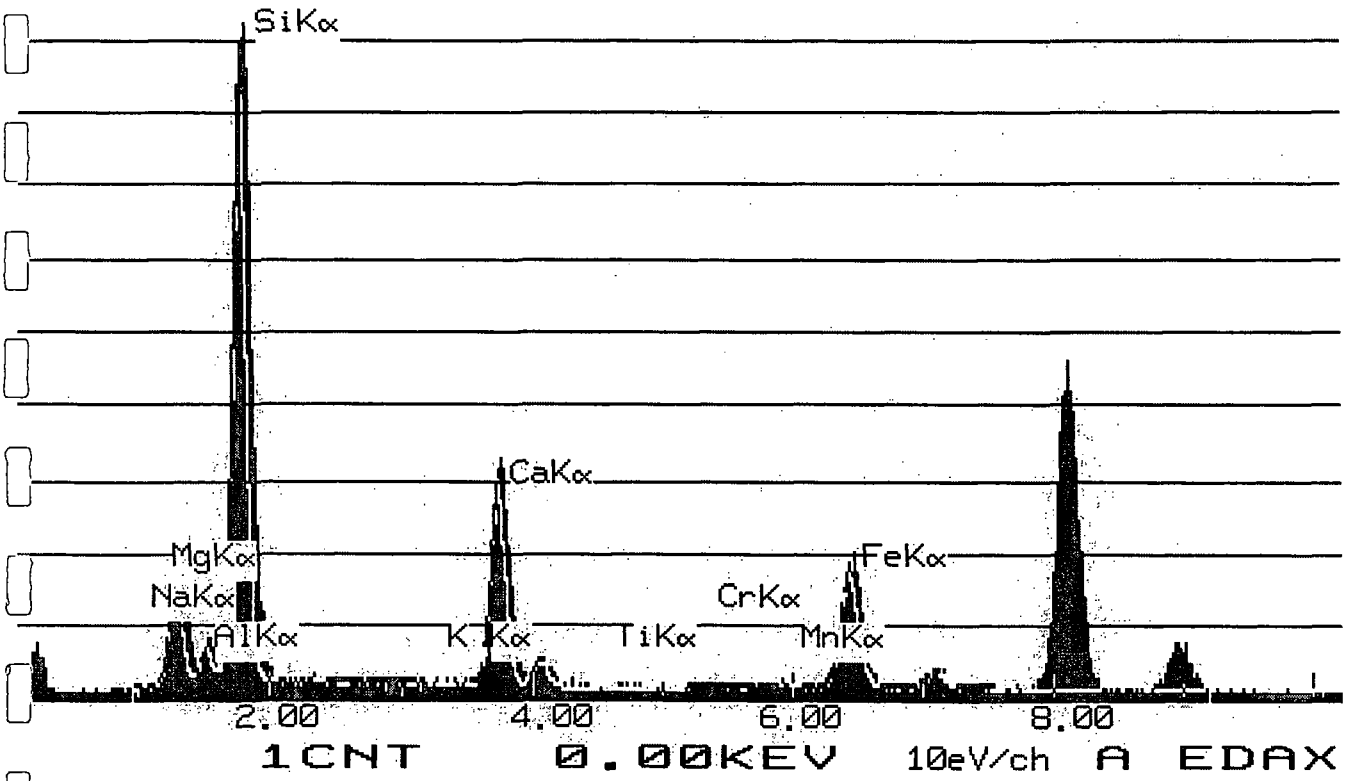


INTE-% :
LABEL = 041210-10 15454
28-NOV-72 22:23:48
20.349 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	72.927	9.120	15.122
ALK	16.807	1.263	2.386
SIK	381.541	26.835	57.411
CAK	142.513	9.557	13.372
FEK	91.945	8.191	11.711
TOTAL			100.000

USED PEIF: USER

27-NOV-04 22:24:19 SUPER QUANT
RATE= 938CPS TIME= 20LSEC
FS= 873/ 873 PRST= 200LSEC
1 =041210-10 15454



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	57.411	Si+4	7.9672	7.9672							
Al2O3	2.386	Al+3	0.3902	0.0328	0.3574						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	11.711	Fe+3	0.0122			0.0122	0.0000				
MgO	15.122	Mg+2	3.1286			3.1286	0.0000				
MnO	0	Fe+2	1.3454			1.3454	0.0000				
CaO	13.372	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.9881					1.9881	0.0000		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100.002		Excess	T site	0.3574	C site	0.0000	B site	0	A site	0
			Total	8		4.8435		1.9881		0.0000	0.0000
			%Fill	100		96.871		99.4026			

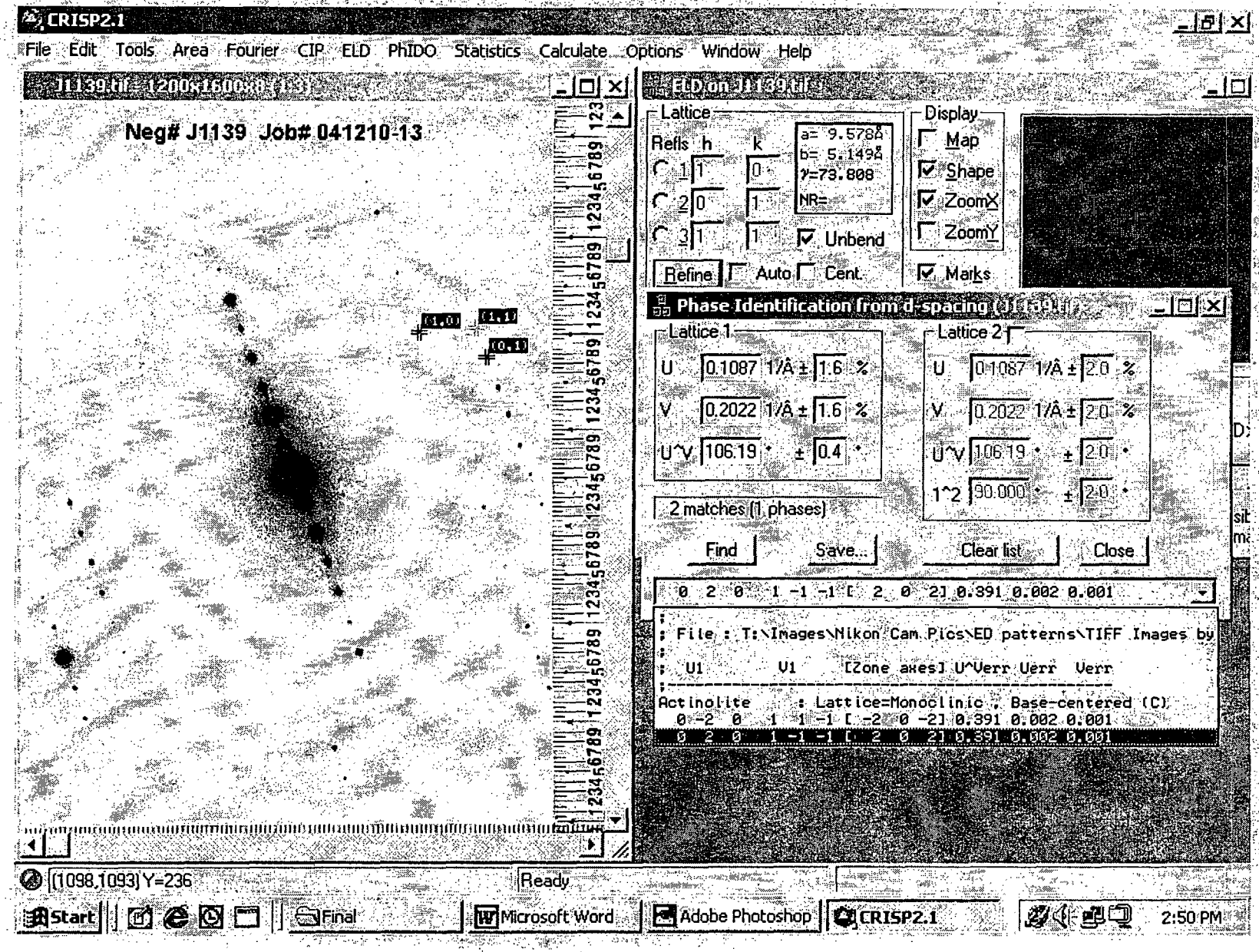
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-10-15454

Values		Satisfied Conditions
(Ca,Na)@B	1.99	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.99	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.70	(Mg/(Mg+Fe2))< 0.9
Si	7.97	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[101]



SUMMARY OF RESULTS
Standardless Analysis

Refit _NaK "_K K" _K K"
Refit _Fl K" _NaK
Refit _MgK "_ALK"
Cff.sqd 5.00E-10

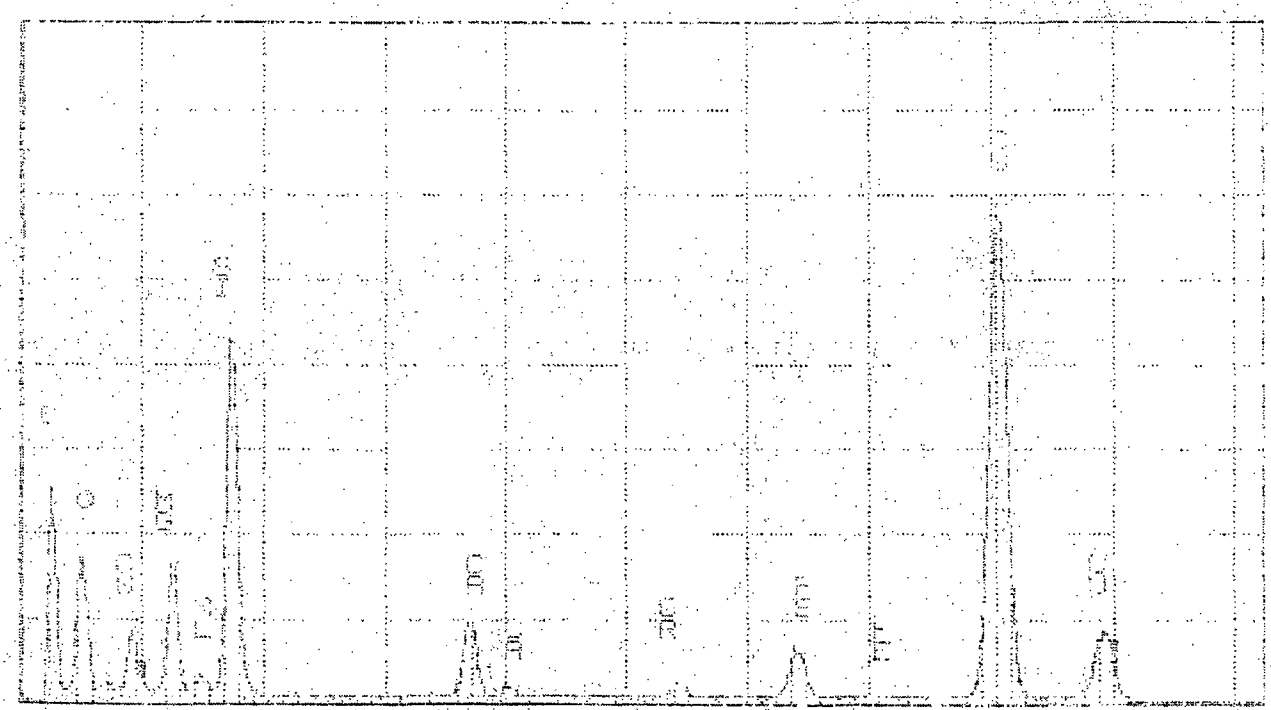
Element	Net Counts
SiK	12097 +/- 144
MgK	5029 +/- 150
AlK	820 +/- 76
PaK	3624 +/- 130
FeK	2742 +/- 84
NaK	0 +/- 0
KK	134 +/- 34

REF-X	FIBS-SIK	FIBS-MGK	FIBS-ALK	FIBS-AUK	FIBS-FEK	FIBS-NAK
FIBS-K						

[illegible]

ELEMENT	PEAK	K-FACTOR	ERROR	WT%	ID. WT%	WT%	ELEMENT
SiK	12097	1.000	1.000	20.17	22.03	55.77	SiO2
MgK	5029	1.000	0.400	16.16	17.71	12.10	MgO
AlK	820	0.750	0.051	1.06	1.20	2.54	Al2O3
FeK	3624	0.949	0.209	4.06	7.71	10.50	CaO
FeK	2742	1.399	0.317	0.19	0.26	11.200	FeO
NaK	0	0.949	0.000	0.00	0.00	0.00	NA2O
KK	134	1.059	0.016	0.04	0.06	0.31	K2O
O			1.750	61.09	45.16		

TN-5600 University of Washington UW TH: 02-DEC-04 10:53
Cursor: 0 2000keV = 0



0 041210-11 SPGM

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	55.77	Si+4	7.6603	7.6603							
Al2O3	2.5	Al+3	0.4047	0.3397	0.0650						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	11.8	Fe+3	0.5976			0.5976	0.0000				
MgO	19.1	Mg+2	3.9111			3.9111	0.0000				
MnO	0	Fe+2	0.6912			0.4263	0.2649				
CaO	10.51	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.5466					1.5466	0.0000		
K2O	0.31	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0543							0.0543	0.0000
Total	99.99		Excess	T site	0.0650	C site	0.2649	B site	0	A site	0
			Total	8		5.0000		1.5466		0.0543	0.0000
			%Fill	100		100		77.3283			

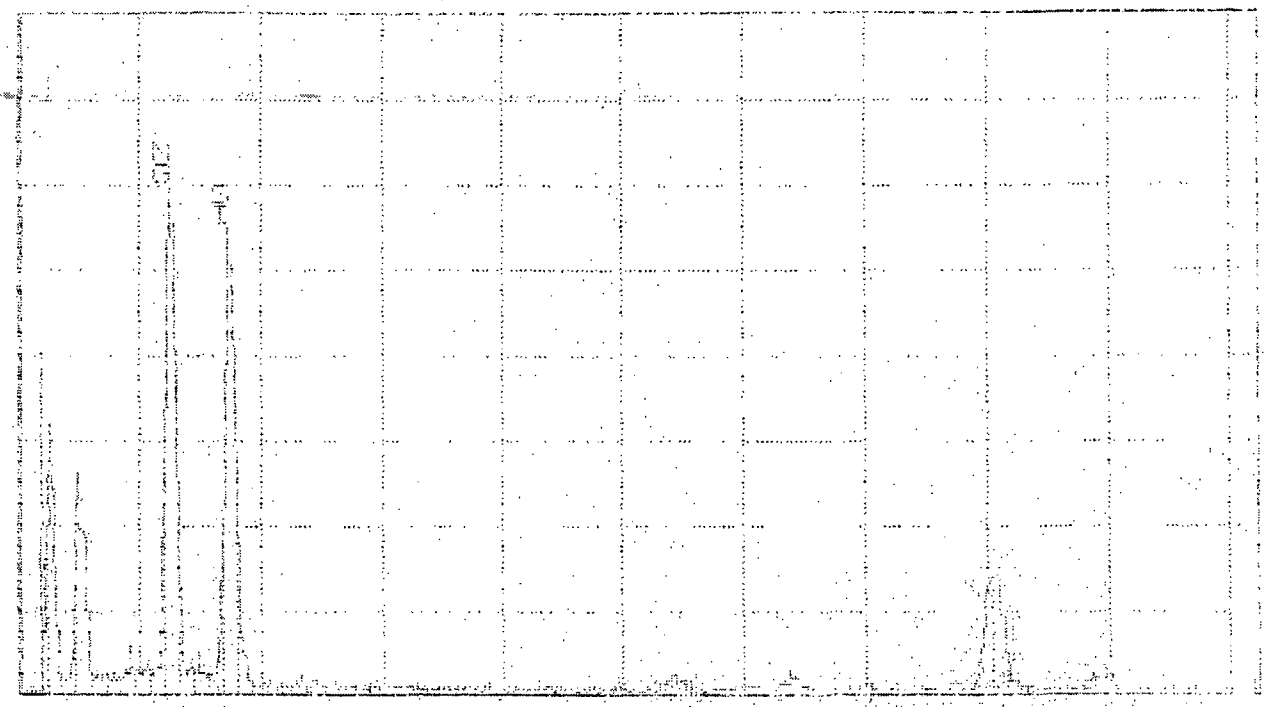
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-13-828

Values		Satisfied Conditions
(Ca,Na)@B	1.55	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.55	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.05	Si > 7.5
Mg/(Mg+Fe2)	0.85	(Mg/(Mg+Fe2))< 0.9
Si	7.66	

Mineral Analysis Program (Version 5.0)

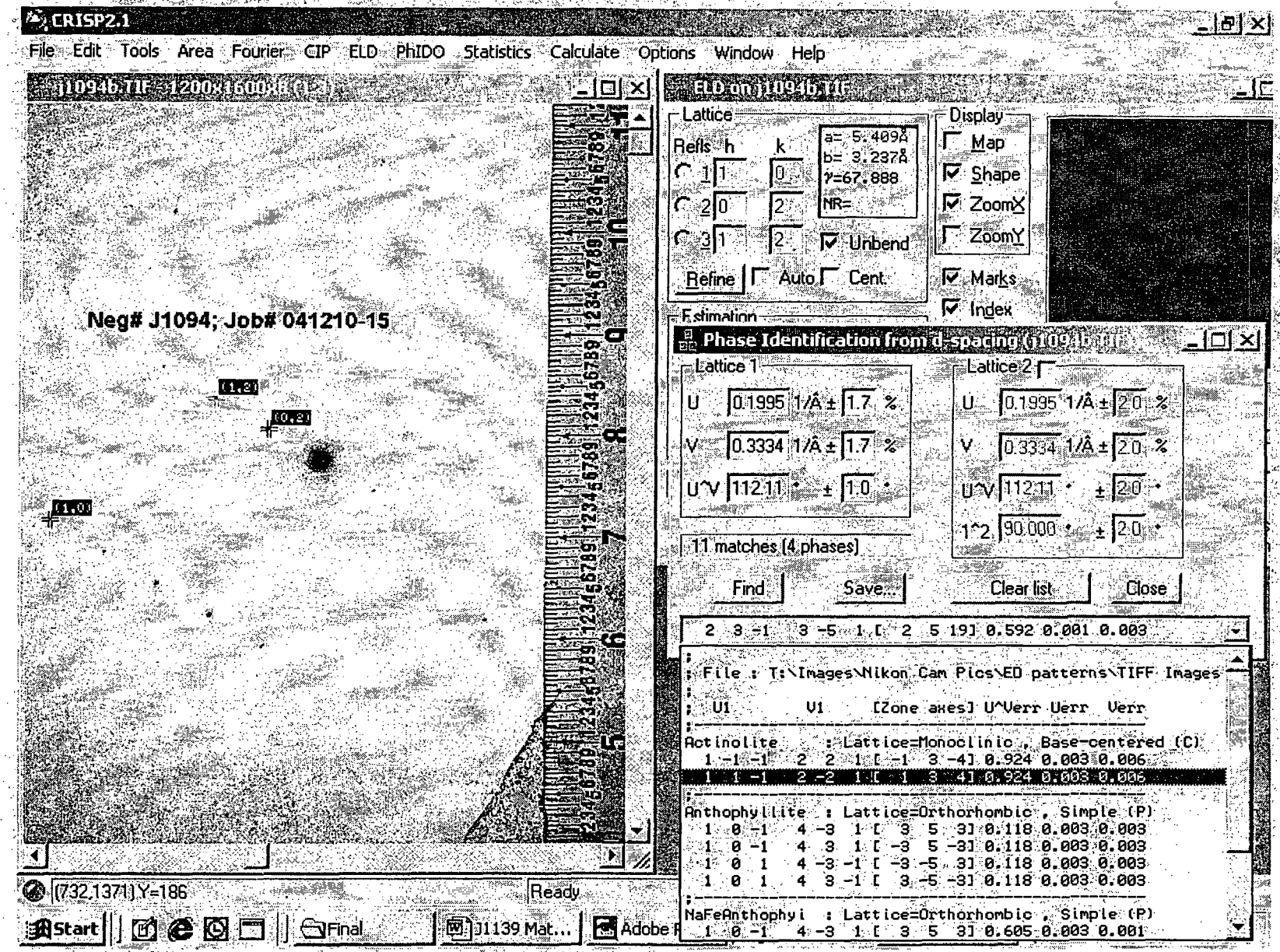
TN-5000 University of Washington / JEO SUN 21-NOV-04 10:5+
Cursor: 0.000keV = 0



/ 000 B- 5 VFS = 256 10.246
21 041210-13 0:7+9

ACTINOLITE

[1 3 4]



SX DYNAMIT

SAMPLE QUANTITY
Standardless Analysis

Filtered = 0.5V

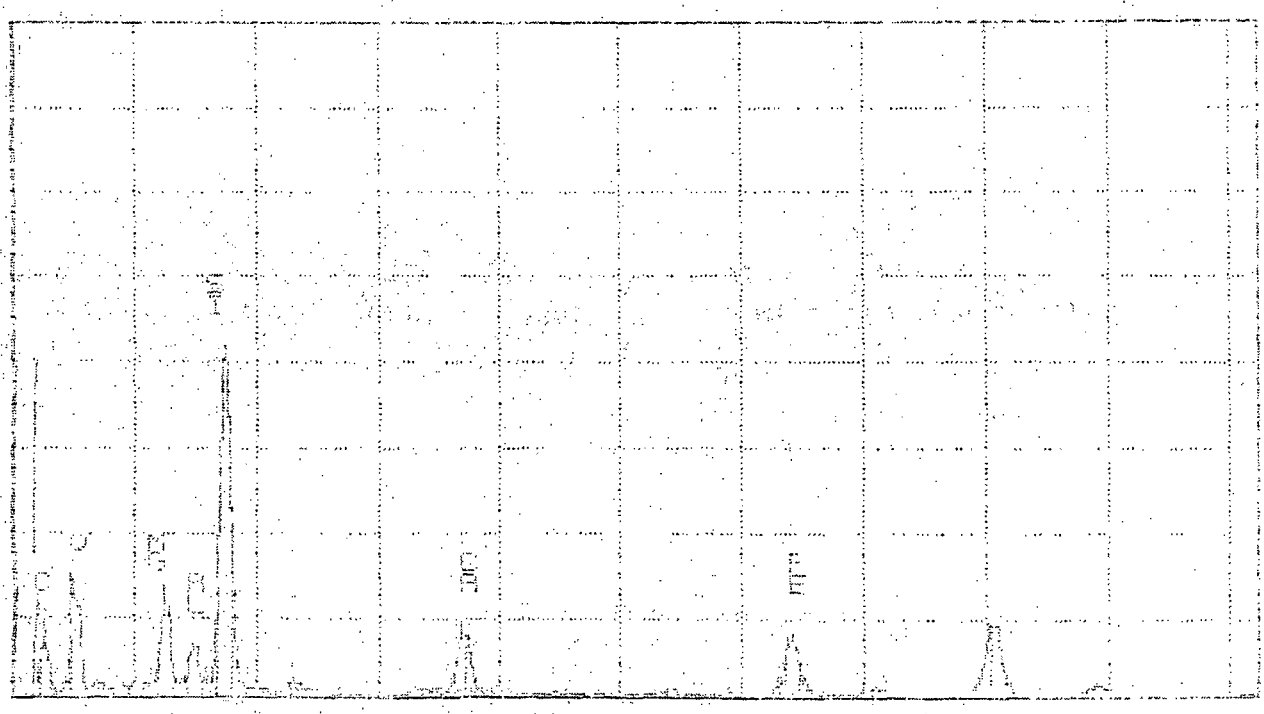
Element	Net Counts
Si-K	11495 +/- 210
Mg K	3011 +/- 204
Al-K	1644 +/- 261
Ca-K	1241 +/- 118
Fe-K	3448 +/- 119
Na-K	173 +/- 100
K-K	274 +/- 71

KRELS FTS=SIK EDS=MGK FDS=ALK FDS=CAK FDS=FEK FDS=NAK FD

SAMPLE 5 SPH01

FILENAME	PEAK	K-RATIO	DEL/ZRF	CONV	FI. WTA	WT%	FORMULA
SIO-K	11495	1.000	1.000	[illegible]	25.66	55.42	SIO2
MGO-K	3011	1.000	2.784	[illegible]	[illegible]	[illegible]	MGO
AL-K	1644	0.300	0.107	[illegible]	[illegible]	[illegible]	[illegible]
CAO-K	1241	0.449	0.268	[illegible]	[illegible]	[illegible]	CAO
FEO-K	3448	1.047	0.436	[illegible]	[illegible]	[illegible]	FEO
NA2O-K	173	0.569	0.017	0.601	0.171	1.03	NA2O
K-K	274	1.059	0.075	[illegible]	0.457	0.79	K2O
C			1.741	41.71	45.04		

TN-5400 University of Washington / JEOL S-IN 20-NOV-84 14:34
Cursor: 0.000KeV = 0



0.000 Br= 5 FS = 20.48 LT 240
64 [illegible] 5 [illegible]

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	55.42	Si+4	7.8318	7.8318							
Al2O3	5.24	Al+3	0.8727	0.1682	0.7045						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	16.11	Fe+3	0.0171			0.0171	0.0000				
MgO	11.29	Mg+2	2.3786			2.3786	0.0000				
MnO	0	Fe+2	1.8847			1.8847	0.0000				
CaO	9.7	Mn+2	0.0000			0.0000	0.0000				
Na2O	1.45	Ca+2	1.4686					1.4686	0.0000		
K2O	0.79	Na+	0.3973					0.3973	0.0000	0.0000	0.0000
		K+	0.1424							0.1424	0.0000
Total	100		Excess	T site	0.7045	C site	0.0000	B site	0	A site	0
			Total	8		4.9849		1.8658		0.1424	0.0000
			%Fill	100		99.6974		93.2907			

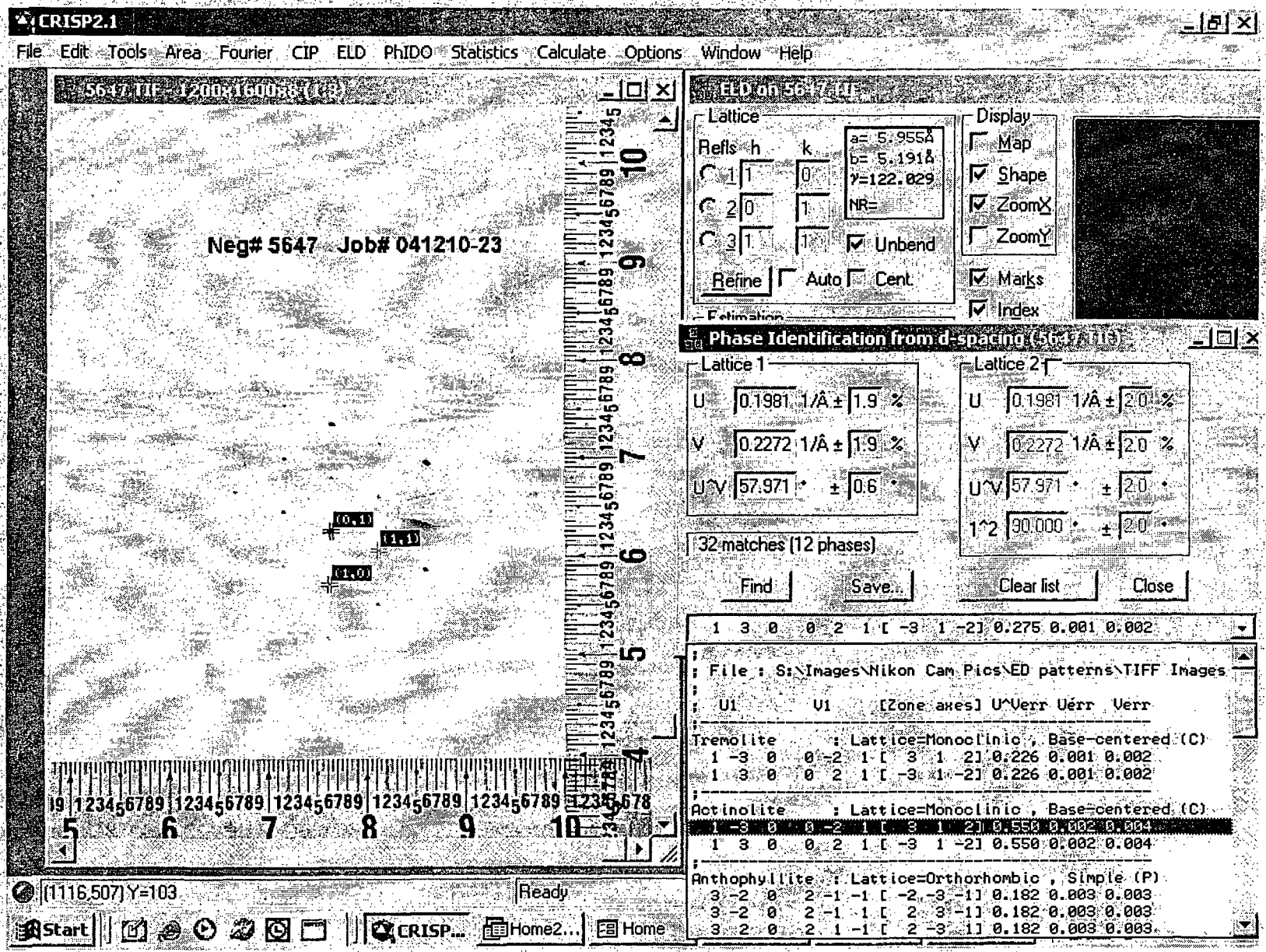
Prefix none
Name probable actinolite Ca values below optimal levels
Modifier none
Group Calcic Amphibole

Sample # 041210-15-802

Values		Satisfied Conditions
(Ca,Na)@B	1.87	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.40	1 < Ca@B < 1.5 and (Na,K)@A < 0.5
Ca@B	1.47	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.14	Si > 7.5
Mg/(Mg+Fe2)	0.56	(Mg/(Mg+Fe2))< 0.9
Si	7.83	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[3 1 2]



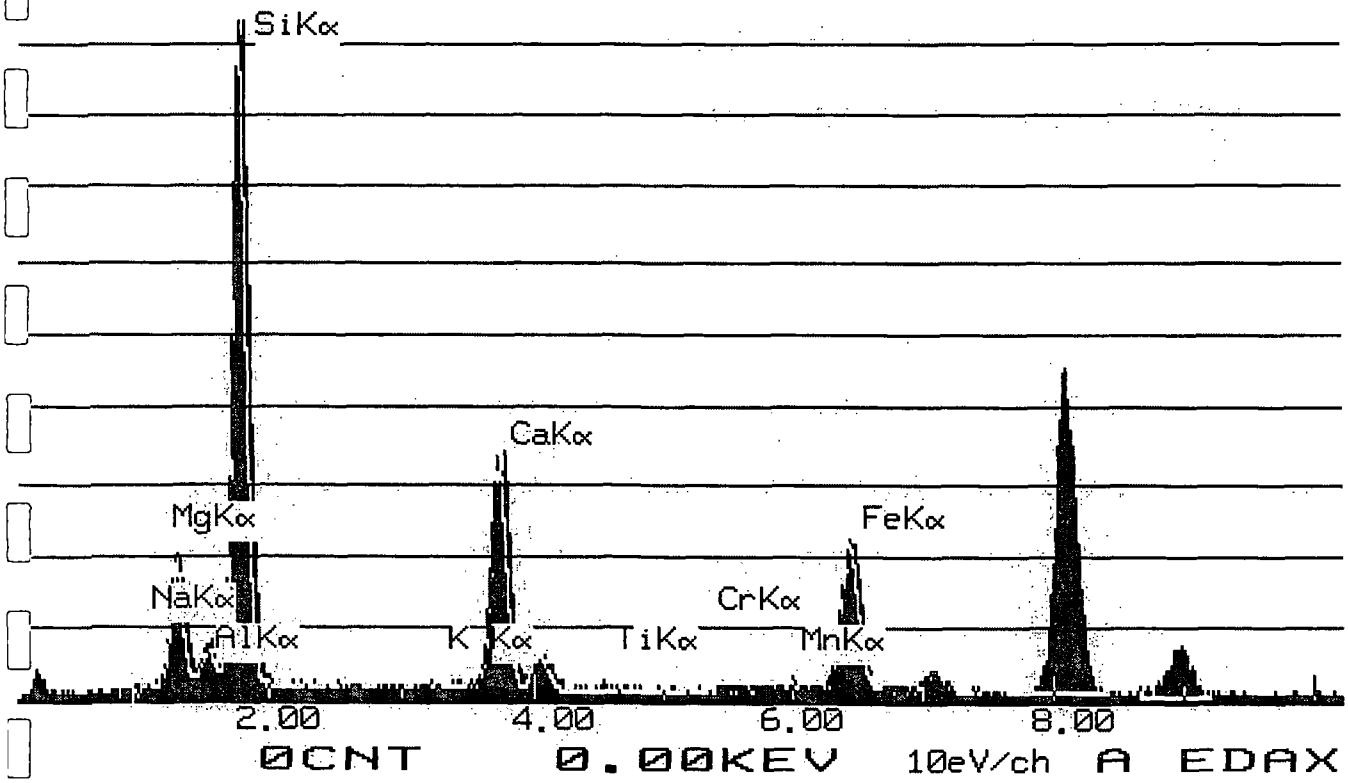
INTE-% :
LABEL = 041210-23 15459
29-NOV-72 03:54:48
20.161 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	76.237	8.795	14.584
ALK	21.676	1.502	2.838
SIK	393.137	25.509	54.573
K K	1.488	0.160	0.193
CAK	162.294	10.040	14.048
TIK	1.587	0.139	0.231
FEK	115.173	9.465	13.533

TOTAL			100.000

USED PEIF: USER

28-NOV-04 03:55:20 SUPER QUANT
RATE= 2095CPS TIME= 20LSEC
TS= 854/ 854 PRST= 200LSEC
A =041210-23 15459



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	54.573	Si+4	7.7108	7.7108							
Al2O3	2.838	Al+3	0.4726	0.2892	0.1834						
TiO2	0.231	Ti+4	0.0245	0.0000	0.0245						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	13.533	Fe+3	0.0144			0.0144	0.0000				
MgO	14.584	Mg+2	3.0720			3.0720	0.0000				
MnO	0	Fe+2	1.5829			1.5829	0.0000				
CaO	14.048	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	2.1265					2.0000	0.1265		
K2O	0.193	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0348							0.0348	0.0000
Total	100		Excess	T site	0.2080	C site	0.0000	B site	0.126473	A site	0
			Total	8		4.8773		2.0000		0.0348	0.0000
			%Fill	100		97.5455		100			

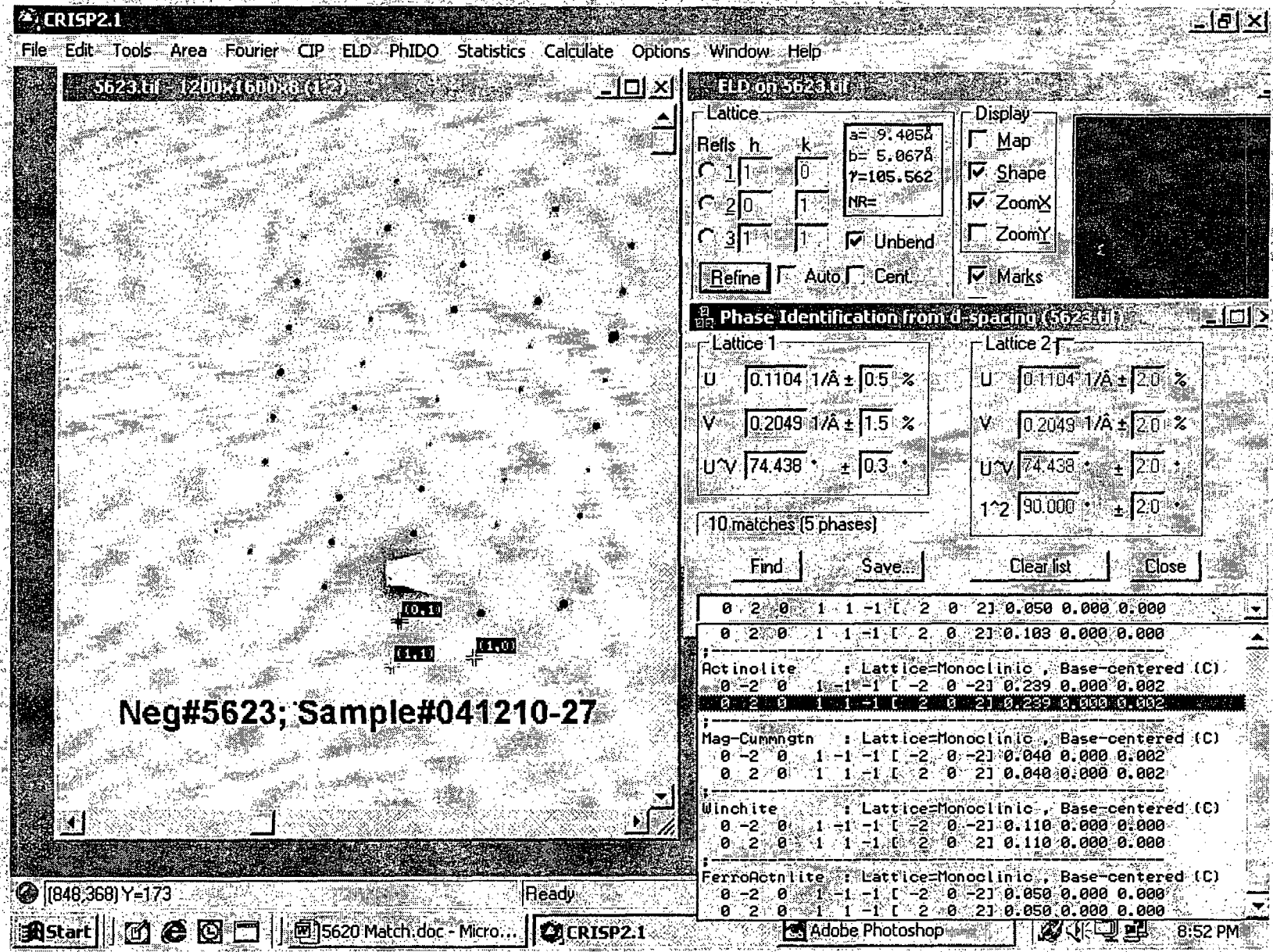
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-23-15459

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.03	Si > 7.5
Mg/(Mg+Fe2)	0.66	(Mg/(Mg+Fe2))< 0.9
Si	7.71	

Mineral Analysis Program (Version 5.0)

Neg#5623; Sample# 041210-27
ACTINOLITE
[-1 0 1]



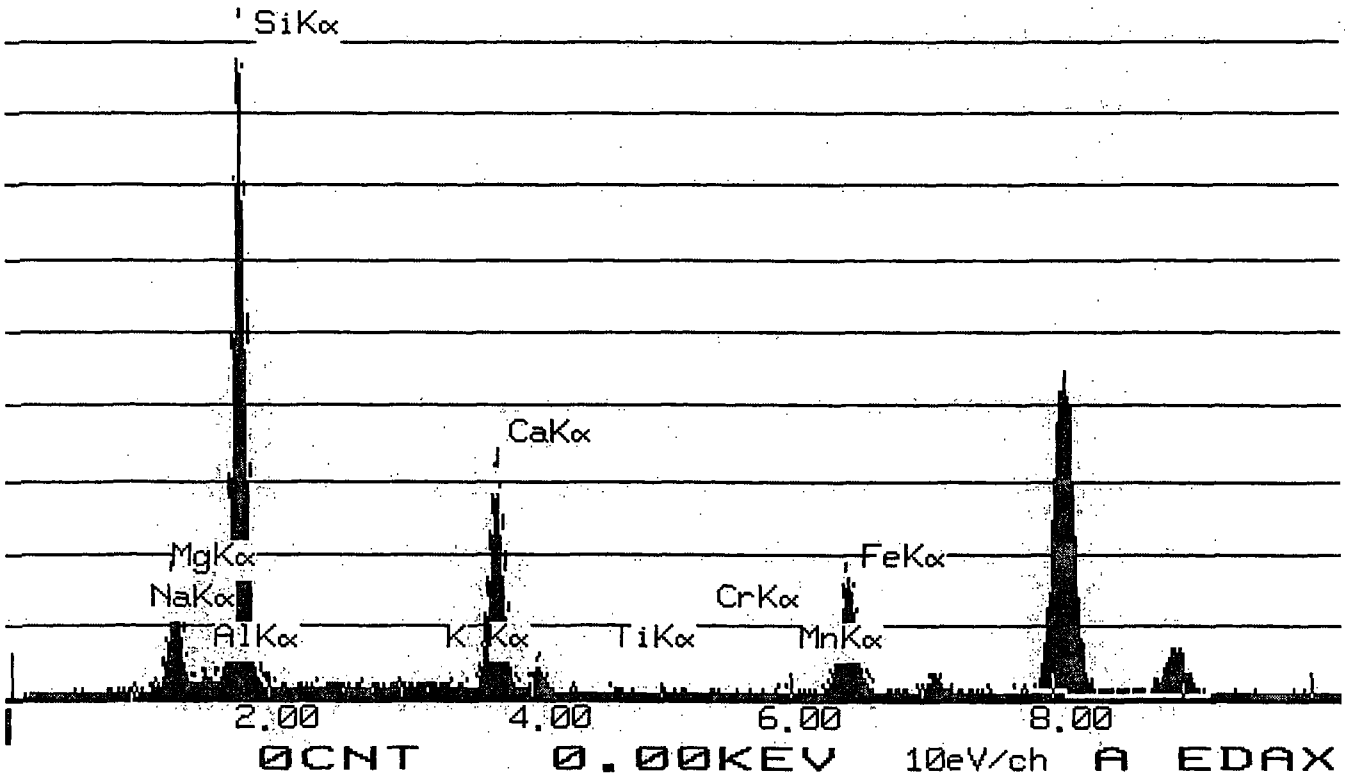
INTE-% :
LABEL = 041210-27 15474
30-NOV-72 10:14:48
40.306 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	54.707	9.722	16.121
ALK	5.012	0.535	1.011
SIK	267.779	26.765	57.260
CAK	102.641	9.781	13.686
TIK	0.645	0.087	0.145
MNK	0.422	0.058	0.075
FEK	64.656	8.185	11.703

TOTAL			100.000

USED PEIF: USER

29-NOV-04 10:15:32 SUPER QUANT
RATE=39468CPS TIME= 40LSEC
FS= 1157/ 1157 PRST= 200LSEC
A =041210-27 15474



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	57.26	Si+4	7.9766	7.9766							
Al2O3	1.011	Al+3	0.1660	0.0234	0.1426						
TiO2	0.145	Ti+4	0.0152	0.0000	0.0152						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	11.703	Fe+3	0.0123			0.0123	0.0000				
MgO	16.121	Mg+2	3.3480			3.3480	0.0000				
MnO	0.075	Fe+2	1.3496			1.3496	0.0000				
CaO	13.686	Mn+2	0.0088			0.0088	0.0000				
Na2O	0	Ca+2	2.0425					2.0000	0.0425		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100.001		Excess	T site	0.1578	C site	0.0000	B site	0.0425235	A site	0
			Total	8		4.8765		2.0000		0.0000	0.0000
			%Fill	100		97.5304		100			

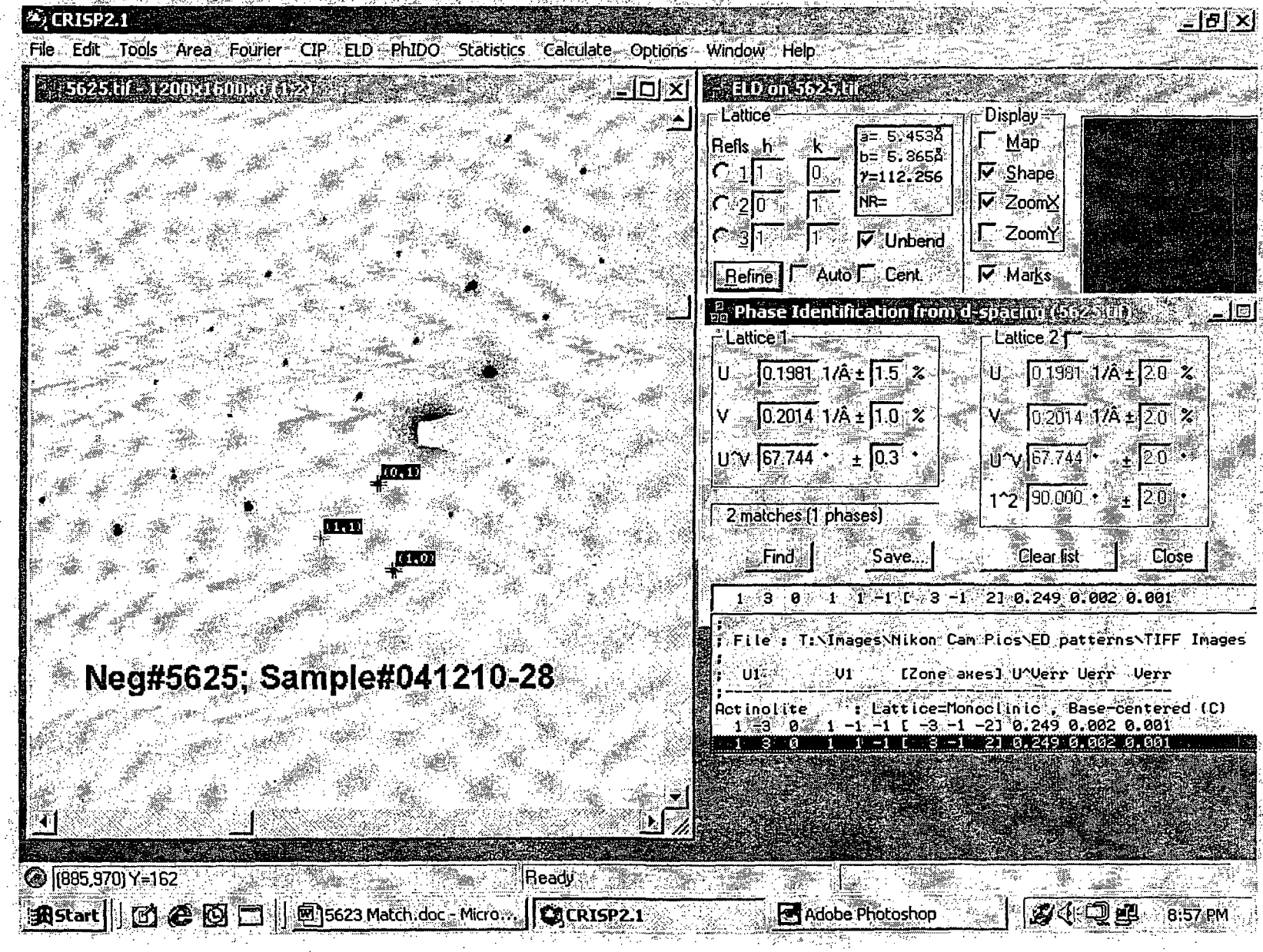
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-27-15474

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.71	(Mg/(Mg+Fe2))< 0.9
Si	7.98	

Mineral Analysis Program (Version 5.0)

Neg#5625; Sample# 041210-28
ACTINOLITE
[-3 -1 2]



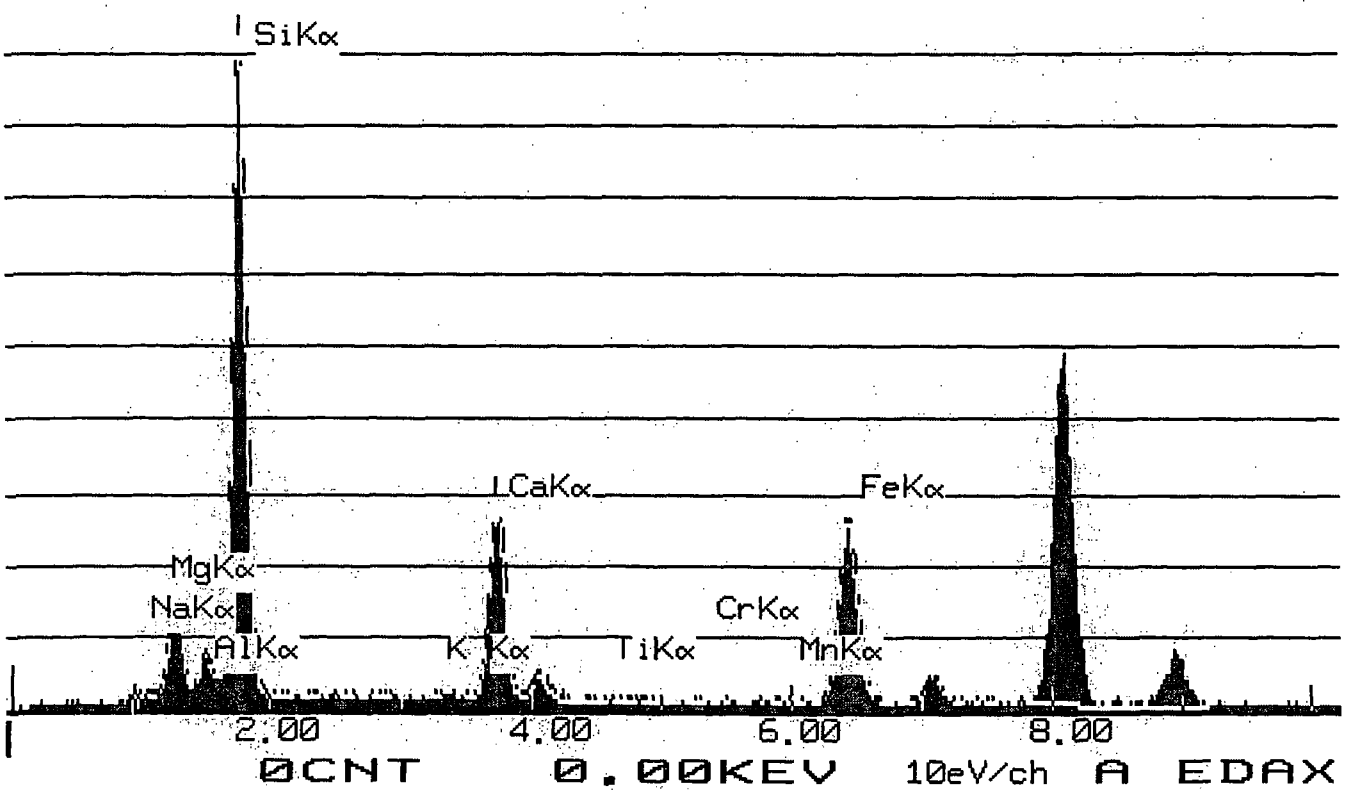
INTE-% :
LABEL = 041210-28 15475
30-NOV-72 11:19:30
94.805 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	13.987	7.200	11.938
ALK	4.704	1.455	2.749
SIK	89.932	26.037	55.702
K K	0.696	0.335	0.403
CAK	30.958	8.545	11.957
TIK	0.137	0.053	0.089
MNK	0.243	0.097	0.125
FEK	32.498	11.917	17.038

TOTAL			100.000

USED PEIF: USER

29-NOV-04 11:20:21 SUPER QUANT
RATE= 6051CPS TIME= 95LSEC
FS= 898/ 898 PRST= 200LSEC
A =041210-28 15475



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	55.702	Si+4	7.9247	7.9247							
Al2O3	2.749	Al+3	0.4609	0.0753	0.3856						
TiO2	0.089	Ti+4	0.0095	0.0000	0.0095						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	17.038	Fe+3	0.0182			0.0182	0.0000				
MgO	11.938	Mg+2	2.5320			2.5320	0.0000				
MnO	0.125	Fe+2	2.0066			2.0066	0.0000				
CaO	11.957	Mn+2	0.0151			0.0151	0.0000				
Na2O	0	Ca+2	1.8225					1.8225	0.0000		
K2O	0.403	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0731							0.0731	0.0000
Total	100.001		Excess	T site	0.3952	C site	0.0000	B site	0	A site	0
			Total	8		4.9671		1.8225		0.0731	0.0000
			%Fill	100		99.3429		91.1229			

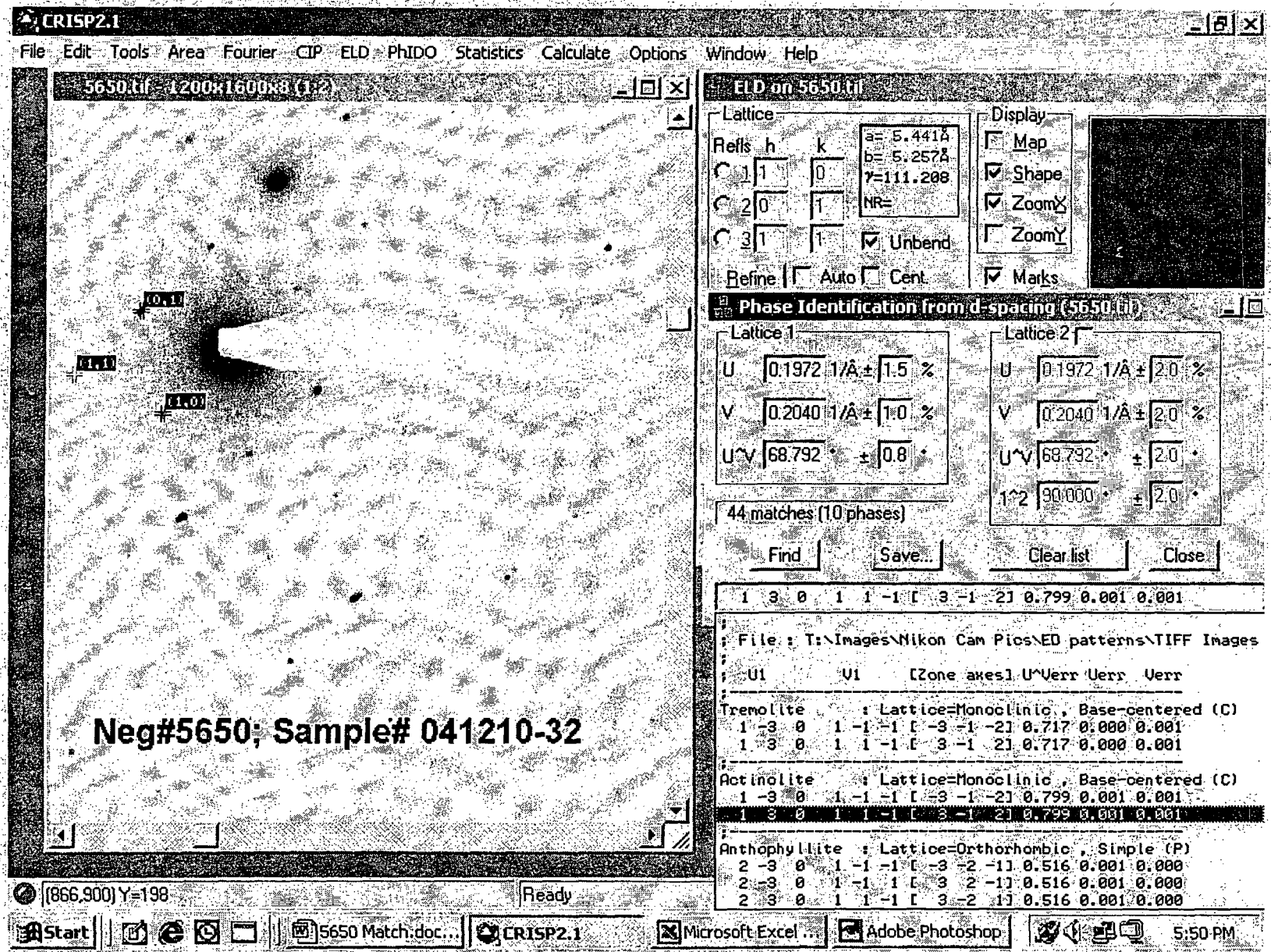
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-28-15475

Values		Satisfied Conditions
(Ca,Na)@B	1.82	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.82	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.07	Si > 7.5
Mg/(Mg+Fe2)	0.56	(Mg/(Mg+Fe2))< 0.9
Si	7.92	

Mineral Analysis Program (Version 5.0)

Neg#5650; Sample# 041210-32
ACTINOLITE
[3 -1 2]

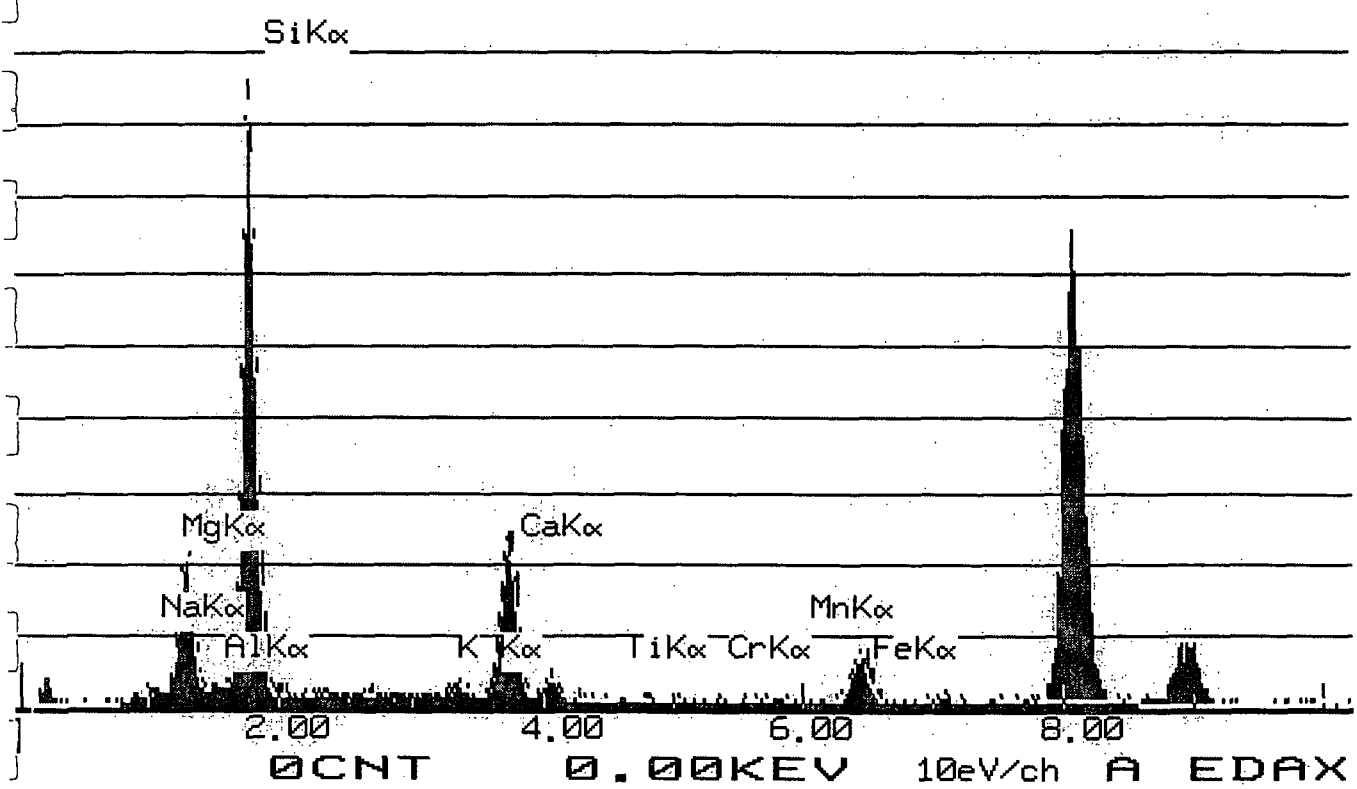


INTE-% :
LABEL = 041210-32 15491
03-DEC-72 03:39:34
96.817 LIVE SECONDS

ELEM	CPS	WT % ELEM	WT % OXIDE
MGK	14.088	12.265	20.337
ALK	0.444	0.232	0.439
SIK	57.799	28.301	60.546
K K	0.919	0.748	0.901
CAK	18.571	8.669	12.130
MNK	0.186	0.125	0.162
FEK	6.187	3.837	5.486
TOTAL			100.000

USED PEIF: USER

02-DEC-04 03:40:25 SUPER QUANT
RATE= 39CPS TIME= 97LSEC
FS= 647/ 647 PRST= 200LSEC
A =041210-32 15491



	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	60.546	Si+4	8.0000	8.0000							
Al2O3	0.439	Al+3	0.0839	0.0000	0.0839						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	5.486	Fe+3	0.0146			0.0146	0.0000				
MgO	20.337	Mg+2	4.1257			4.1257	0.0000				
MnO	0.162	Fe+2	0.6327			0.6327	0.0000				
CaO	12.13	Mn+2	0.0388			0.0388	0.0000				
Na2O	0	Ca+2	1.7787					1.7787	0.0000		
K2O	0.901	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.1703							0.1703	0.0000
Total	100.001		Excess	T site	0.0839	C site	0.0000	B site	0	A site	0
			Total	8		4.8956		1.7787		0.1703	0.0000
			%Fill	100		97.9125		88.935			

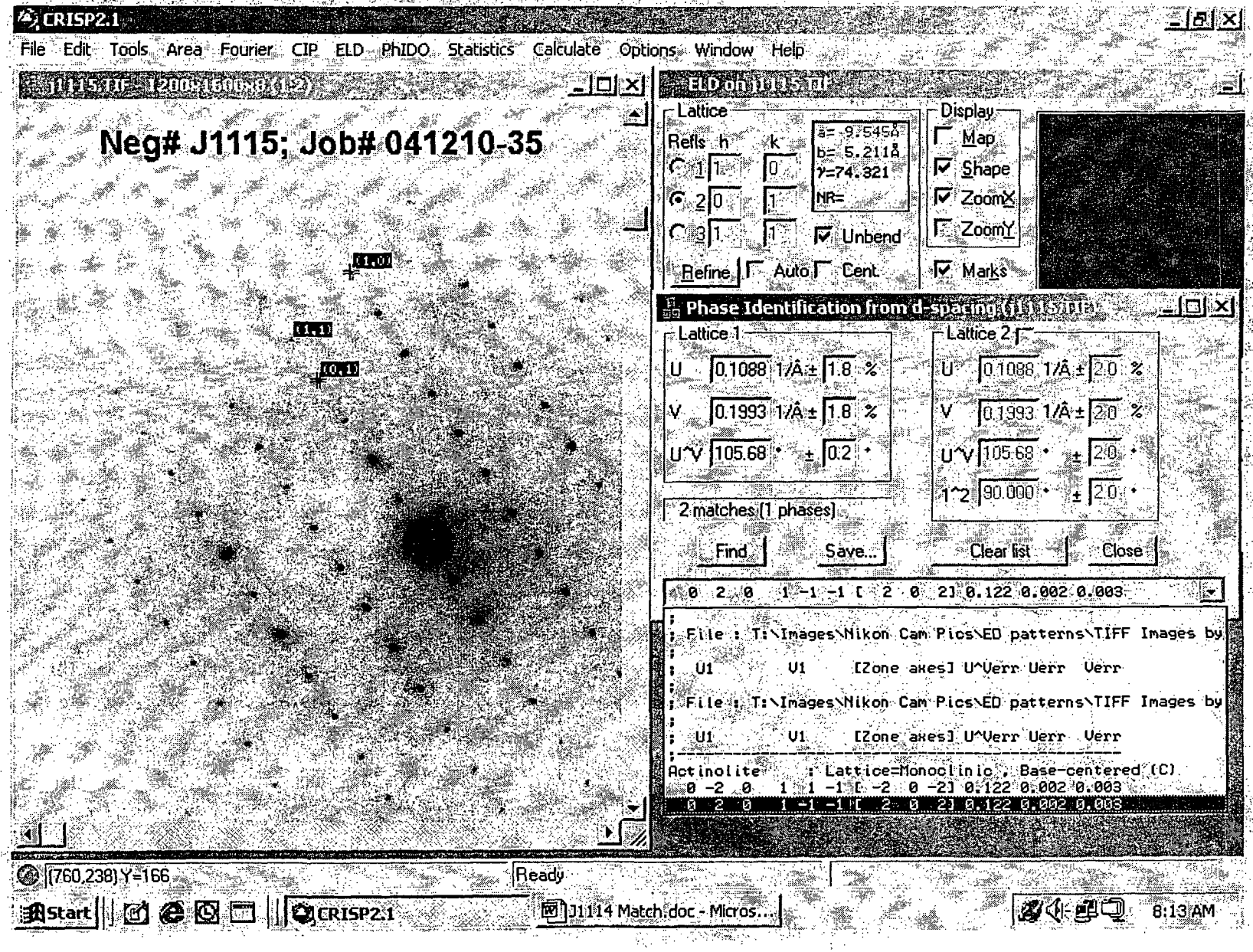
Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # 041210-32-15491

Values		Satisfied Conditions
(Ca,Na)@B	1.78	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.78	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.17	Si > 7.5
Mg/(Mg+Fe2)	0.87	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[101]



Standardless Analysis

Ratio: _NAK' _NAK" _K K' _K K"
Ratio: _MGK' _ALK' _ALK" _NAK _K K
Chi-sqd = 1.64

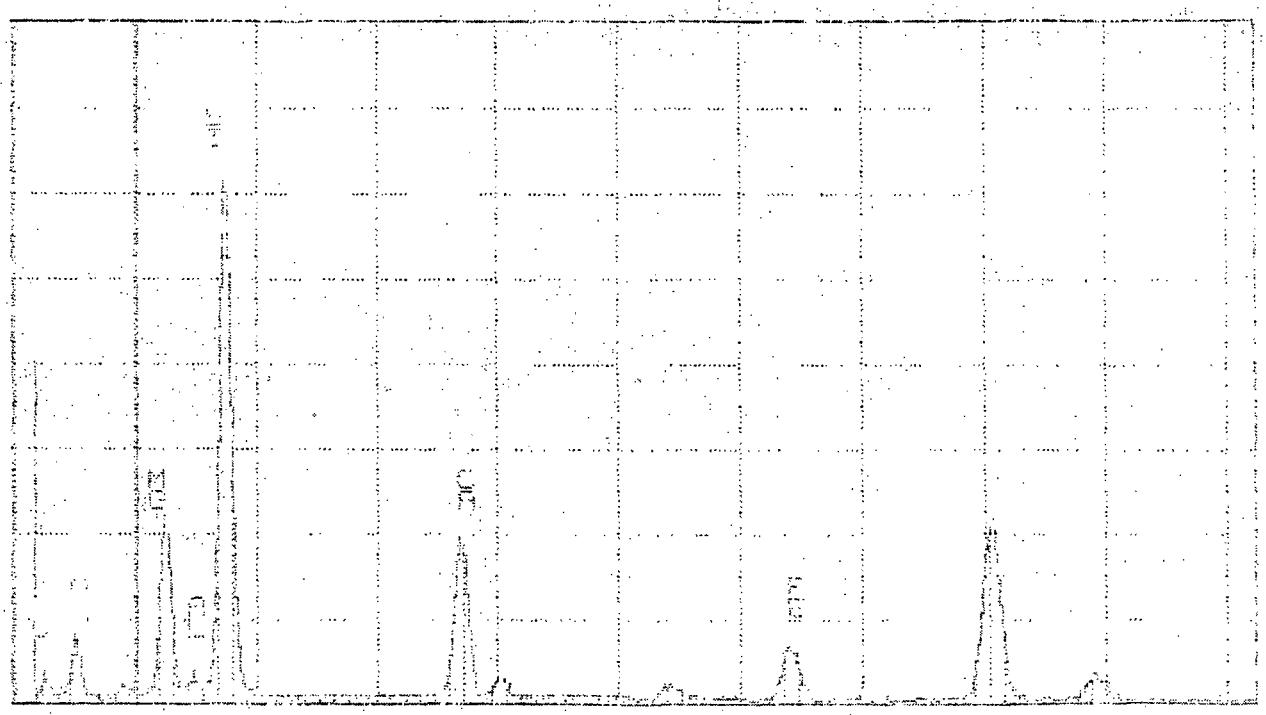
Element	Net Counts
Si-K	16800 +/- 189
Mg-K	6400 +/- 137
Al-K	610 +/- 77
Ca-K	7546 +/- 164
Fe-K	2174 +/- 124
Na-K	0 +/- 0
K -K	0 +/- 0

[illegible]

041210-05 SPU1.1

EL Line	PEAK	K-FACTOR	CPL/CREF	ATOM%	EL-WT%	WT%	FORMULA
Si-K	16800	1.000	1.000	21.47	27.56	59.04	SiO2
Mg-K	6400	1.000	0.340	5.47	7.30	10.64	MgO
Al-K	610	0.750	0.024	0.54	0.67	1.27	Al2O3
Ca-K	7546	0.947	0.381	5.70	10.51	14.72	CaO
Fe-K	2174	1.304	0.118	1.52	5.52	7.11	FeO
Na-K	0	0.847	0.000	0.00	0.00	0.00	Na2O
K -K	0	1.059	0.000	0.00	0.00	0.00	K2O
O			1.000	61.41	45.75		

TN-5500 University of Washington [illegible] 12-NOV-04 [illegible]
Cursor: 1.020keV = 25



0.000 [illegible] 5 [illegible] = 20.48 10.24
[illegible] 04/10/04 [illegible]

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	59.06	Si+4	8.0000	8.0000							
Al2O3	1.27	Al+3	0.2201	0.0000	0.2201						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	9.31	Fe+3	0.0188			0.0188	0.0000				
MgO	15.64	Mg+2	3.2423			3.2423	0.0000				
MnO	0	Fe+2	1.0800			1.0800	0.0000				
CaO	14.72	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	2.1945					2.0000	0.1945		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100		Excess	T site	0.2201	C site	0.0000	B site	0.1944531	A site	0
			Total	8		4.5612		2.0000		0.0000	0.0000
			%Fill	100		91.2242		100			

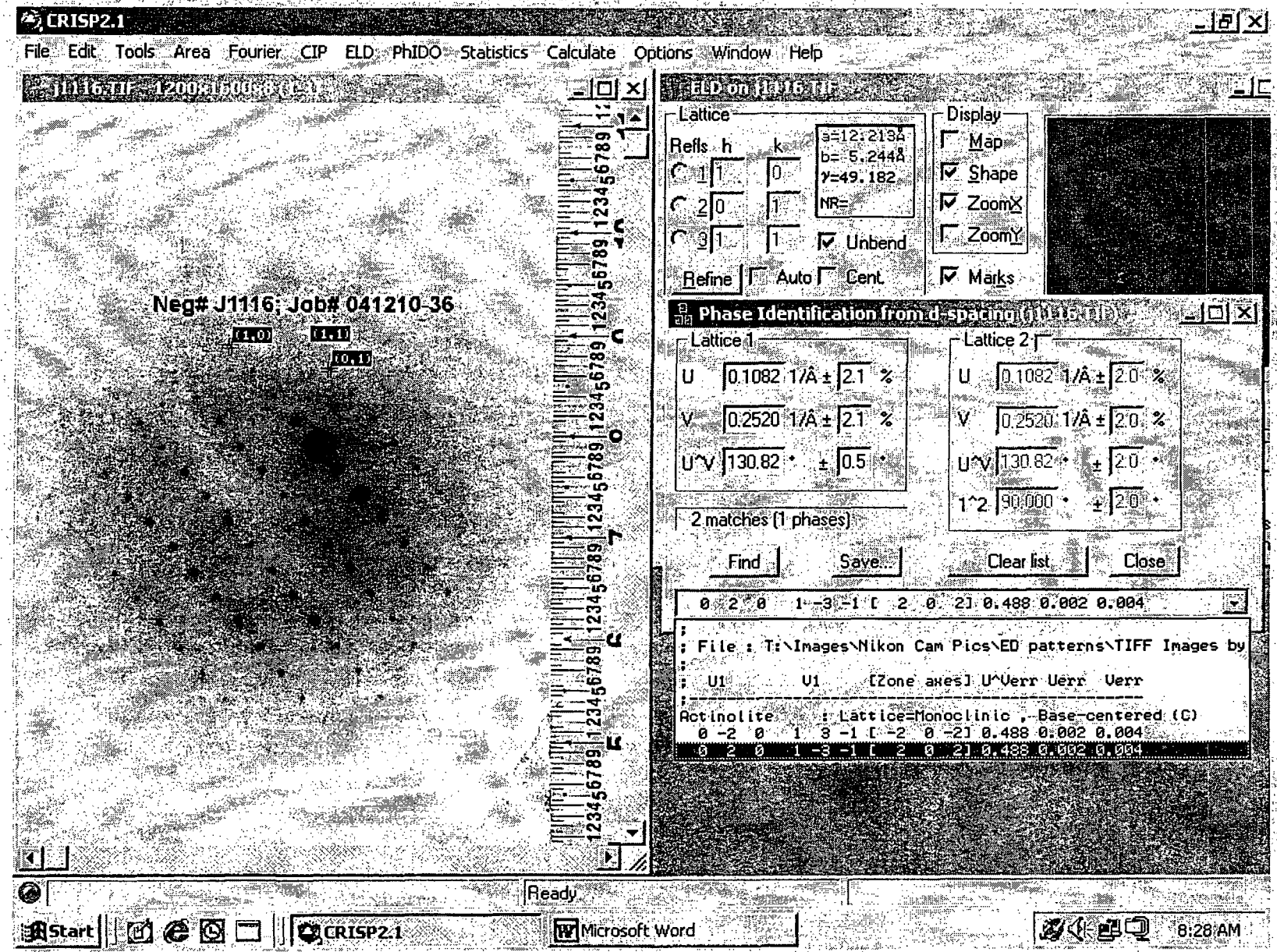
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-35-813

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	2.00	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.75	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[101]



0,0

*

*

*

Kaf: _ALK" _ALK" _NAK" _NAK" _K K" _K K"

Kaf: _MG+ _FIK" _NAK _K K

Mg-mgd = 4.17

*

Element	Net Counts	
Si-K	13445 +/-	168
Mg-K	4854 +/-	125
Standardless Analysis		
Ca-K	4447 +/-	100
Fe-K	3480 +/-	86
Na-K	0 +/-	0
K-K	0 +/-	0

KRATIO EDS:BLK EDS:MMA EDS:ALK EDS:LAK EDS:LIK EDS:MAK
EDS:KLK

Mg(10-CA) SPU14

Element	PEAK	K-RATIO	LB/CREF	A(0)%	EL WT%	WT%	FORMULA
Si-K	13445	1.000	1.000	21.04	46.94	67.70	SIO2
MG-K	4854	1.000	0.1554	9.73	1.59	15.90	MGO
Al-K	3[illegible]	0.750	0.017	0.74	0.45	0.94	AL2O3
Ca-K	4447	0.949	0.2100	4.55	8.74	11.46	CAO
Fe-K	4[illegible]3	1.000	0.3557	3.76	9.63	13.76	FEO(T)
Na-K	0	0.549	0.000	0.00	0.00	0.00	NA2O
K-K	0	1.059	0.000	0.00	0.00	0.00	K2O
Σ			1.6[illegible]2	61.55	45.05		

TN-5600 University of Washington / JHU TUE-30-NOV 04 [illegible]

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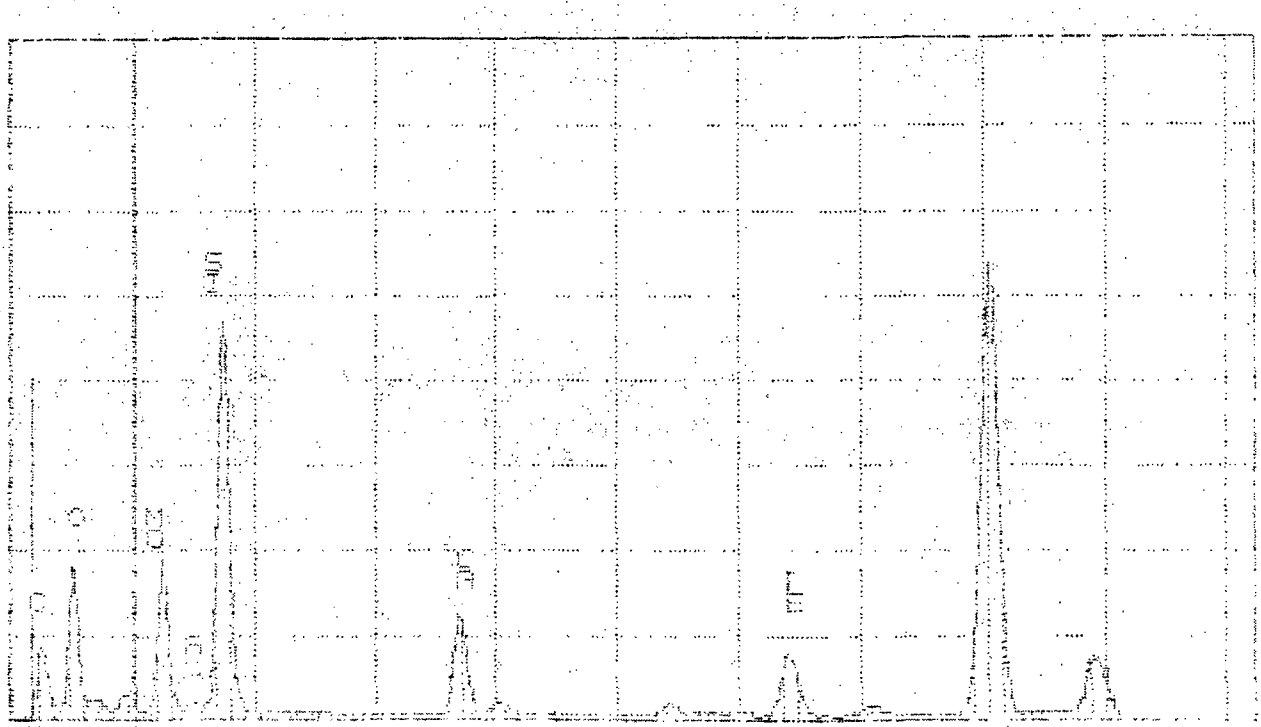


0.000 [illegible] Vrtx = 2048 10.240

39 [illegible]

*

0,0

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	57.74	Si+4	8.0000	8.0000							
Al2O3	0.84	Al+3	0.1389	0.0000	0.1389						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	13.76	Fe+3	0.3315			0.3315	0.0000				
MgO	15.98	Mg+2	3.3100			3.3100	0.0000				
MnO	0	Fe+2	1.2317			1.2196	0.0121				
CaO	11.68	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.7393					1.7393	0.0000		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100		Excess	T site	0.1389	C site	0.0121	B site	0	A site	0
			Total	8		5.0000		1.7393		0.0000	0.0000
			%Fill	100		100		86.9662			

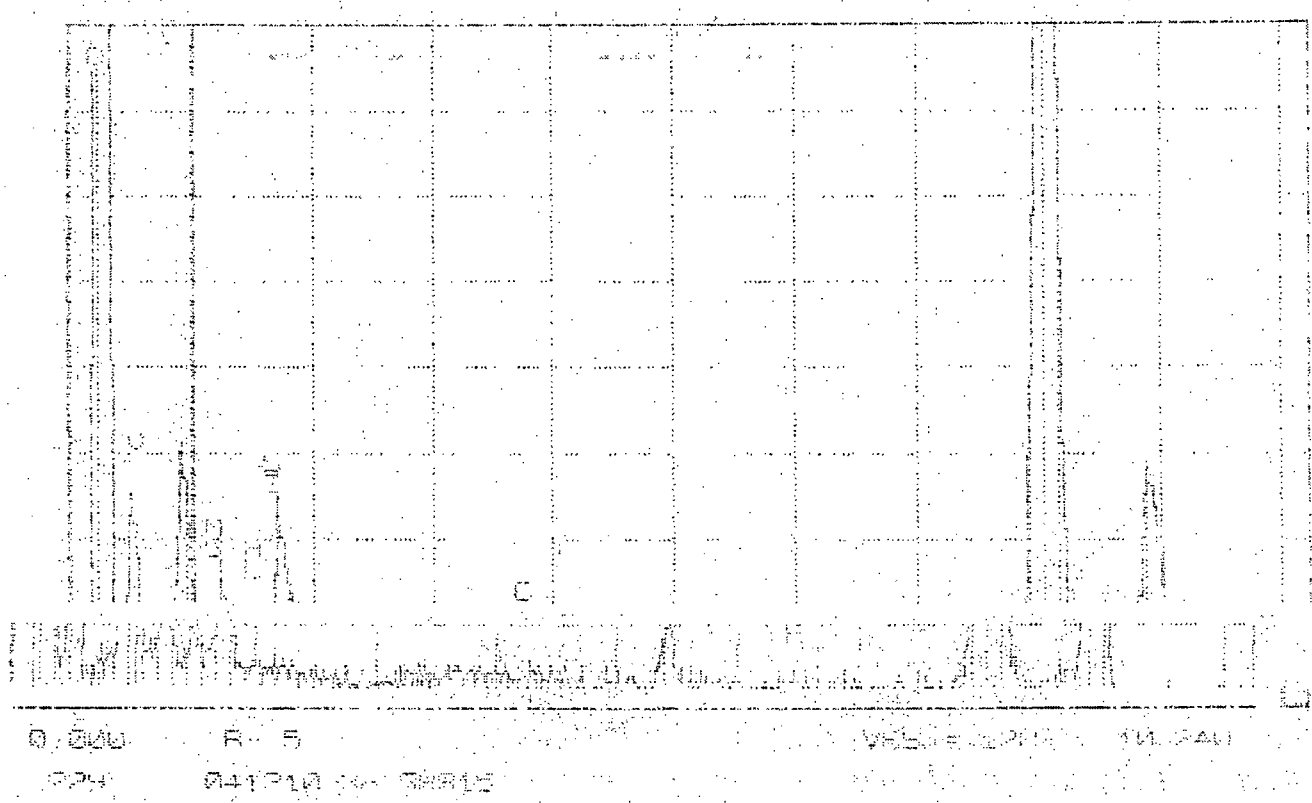
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-36-814

Values		Satisfied Conditions
(Ca,Na)@B	1.74	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.74	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.73	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)

TN-EDAX University of Washington / Mech. [illegible] 12:40:
Current: 1.00keV = 14



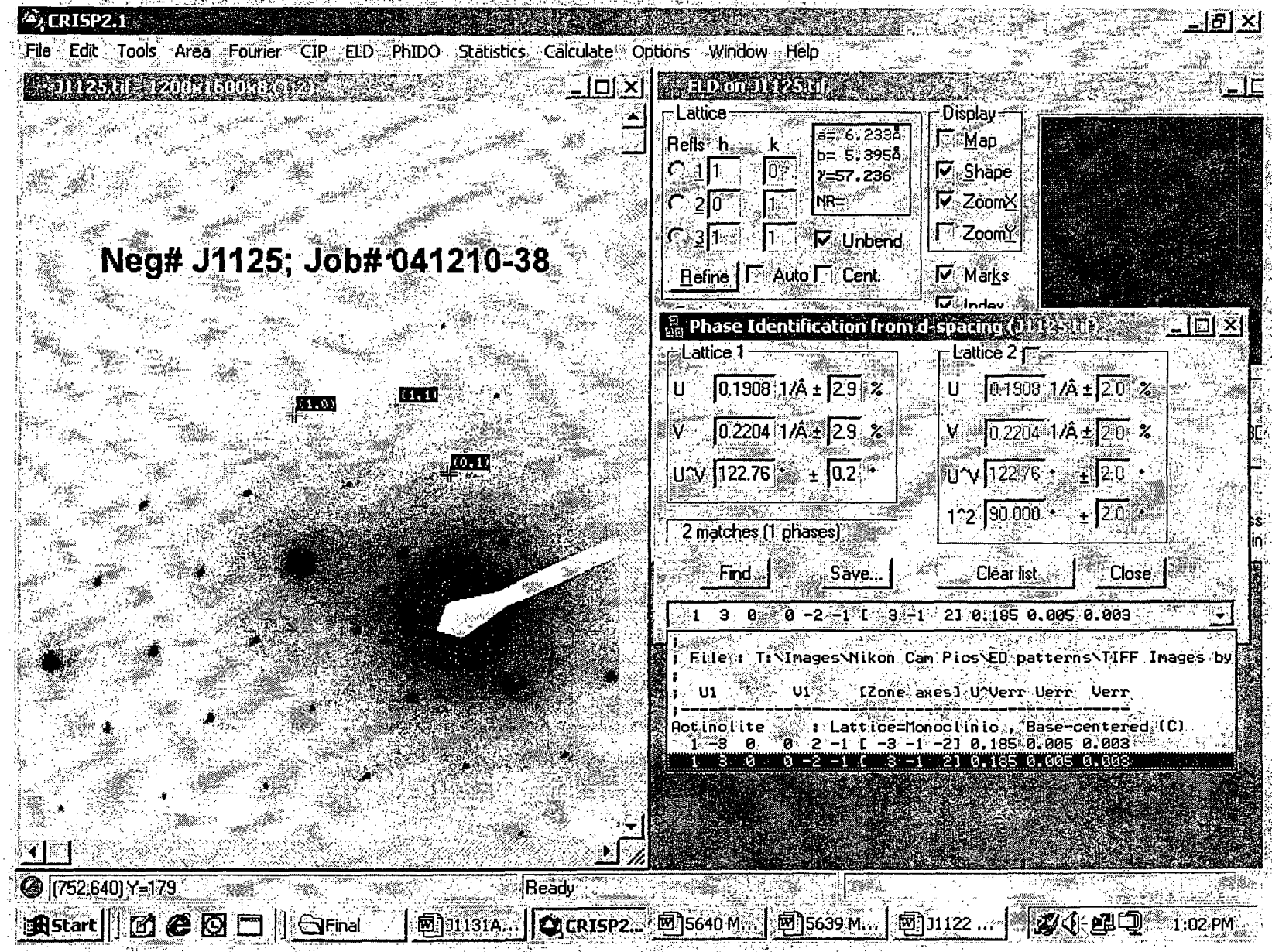
0.0
0.0
0.0
0.0
0.0
0.0
*X SUMMARY

SUMMARY
Standardless Analysis

Ref1: _K K' _K K"
Ref11: _MGK' _AL K" _FEK"
Chi-sqrd = 2.17

Element	Net Counts	
Al-K	3521 +/-	194
Mg-K	1410 +/-	127
Al-K	788 +/-	56
Ca-K	809 +/-	62
Na-K	148 +/-	40
[illegible]	[illegible] +/-	[illegible]

ACTINOLITE
[3 -1 2]



[illegible]
[illegible]
Standardless Analysis

Matrix _NAK' _NAK" _K K' _K K"
Ratio _NAK' _K K" _FEK" _NAK _K K
Chi sqd = 2.76

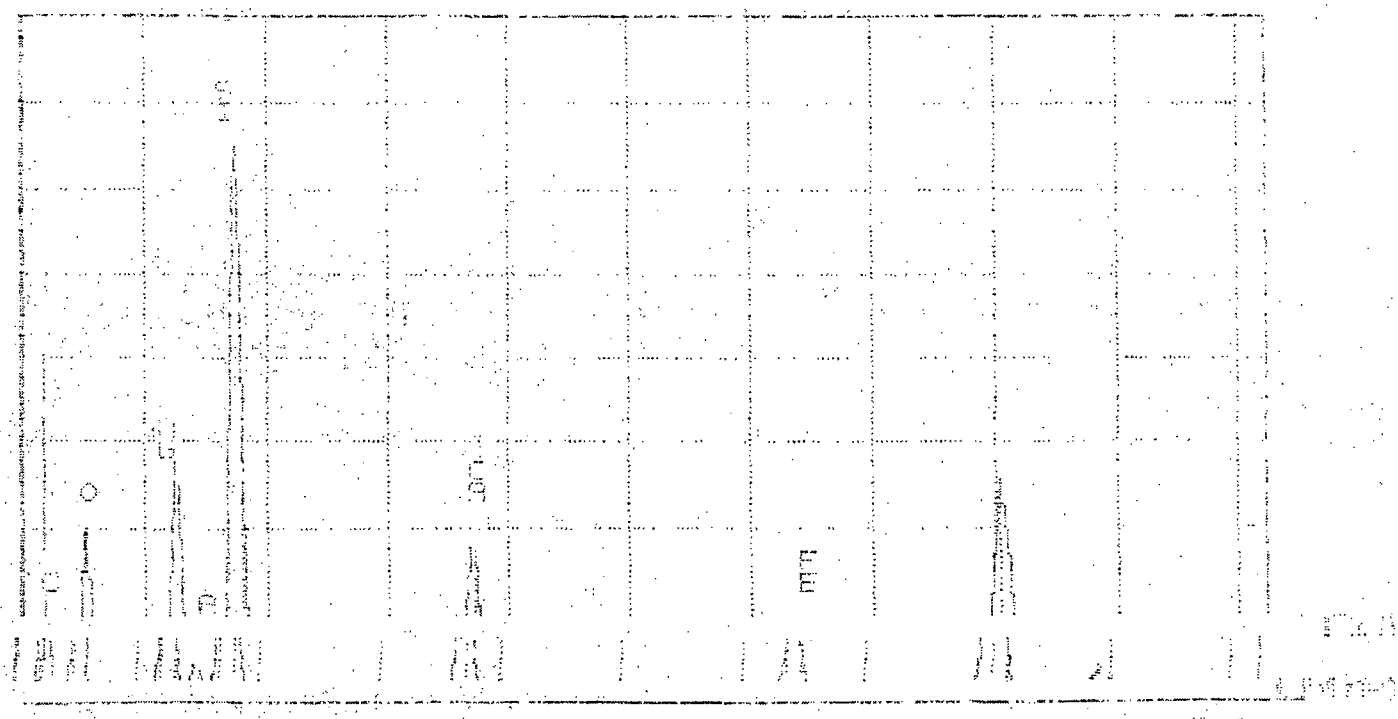
Element	Net Counts	
Si-K	1841A +/-	278
Mg-K	7113 +/-	140
Al-K	4153 +/-	280
Ca-K	4562 +/-	137
Fe-K	4143 +/-	72
Na-K	0 +/-	0
K-K	0 +/-	0

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] 3R [illegible]

EL-LINE	PEAK	K-RATIO	CEL/CREF	ATOM%	WT %	WT%	FORMULA
SI-K	1841A	1.000	1.000	20.67	[illegible]	[illegible]	[illegible]
MG-K	7113	1.000	0.396	9.37	10.77	17.12	MGO
AL-K	[illegible]	0.700	0.[illegible]	0.55	0.[illegible]	1.09	[illegible]
CA-K	4562	0.[illegible]	0.[illegible]	1.90	9.00	[illegible]	CAO
FE-K	4143	1.[illegible]	0.317	3.27	8.42	[illegible]	FEO(T)
NA-K	0	0.000	0.000	0.000	0.00	0.000	NA2O
K-K	0	0.000	0.000	0.000	0.00	0.000	K2O
			1.405	[illegible]	45.04		

IN-SEOD University of Washington (UW) TUE 30-NOV-04 [illegible]
Current 0.000[illegible] = 0



0.2mm 5- 5 [illegible] = 0mm 11 24M

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	56.96	Si+4	7.8978	7.8978							
Al2O3	1.29	Al+3	0.2108	0.1022	0.1086						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.03	Fe+3	0.2134			0.2134	0.0000				
MgO	17.12	Mg+2	3.5389			3.5389	0.0000				
MnO	0	Fe+2	1.1577			1.1392	0.0185				
CaO	12.6	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.8717					1.8717	0.0000		
K2O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000							0.0000	0.0000
Total	100		Excess	T site	0.1086	C site	0.0185	B site	0	A site	0
			Total	8		5.0000		1.8717		0.0000	0.0000
			%Fill	100		100		93.5832			

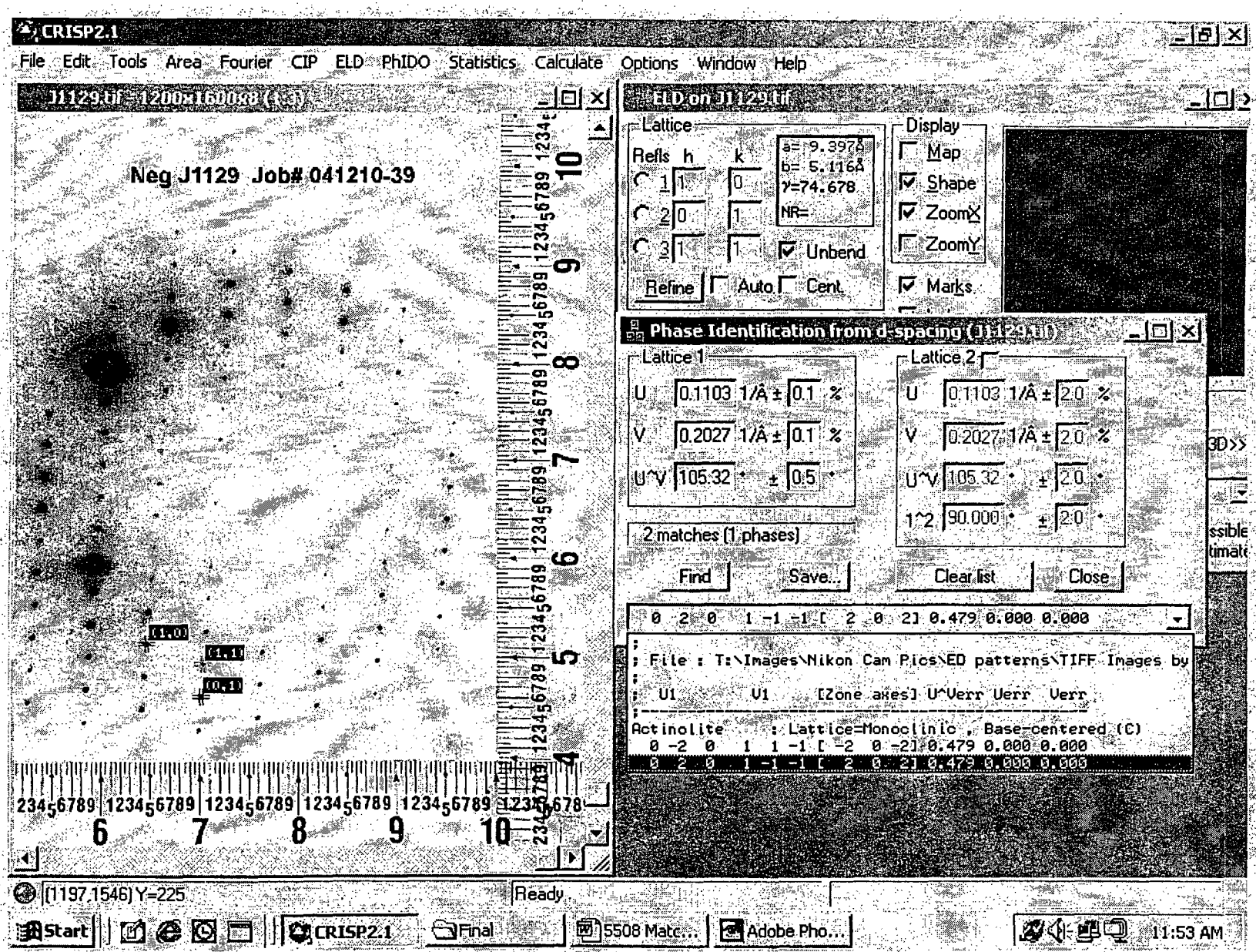
Prefix	none
Name	actinolite
Modifier	none
Group	Calcic Amphibole

Sample # 041210-38-820

Values		Satisfied Conditions
(Ca,Na)@B	1.87	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.87	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00	Si > 7.5
Mg/(Mg+Fe2)	0.75	(Mg/(Mg+Fe2))< 0.9
Si	7.90	

Mineral Analysis Program (Version 5.0)

ACTINOLITE
[101]



*X 'SUMTF'

SUMTF: QUANTIFY
Standardless Analysis

Title [illegible]
Date: [illegible]
Chi-sqr = 1.52

Element	Net Counts	
Si K	4950 +/-	101
Mg K	1518 +/-	86
Al K	847 +/-	49
[illegible]	720 +/-	73
Ca K	1003 +/-	64
[illegible]	62 +/-	41
[illegible] K	34 +/-	17

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

041210-79 BWS

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	1.0000	1.000	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Al-K	137	0.756	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ca K	[illegible]	0.949	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	1.099	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	92	0.747	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	24	1.059	0.007	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			1.446	61.70	45.26		

TN-550A University of Washington / [illegible] WS: 01-[illegible]-06 [illegible]
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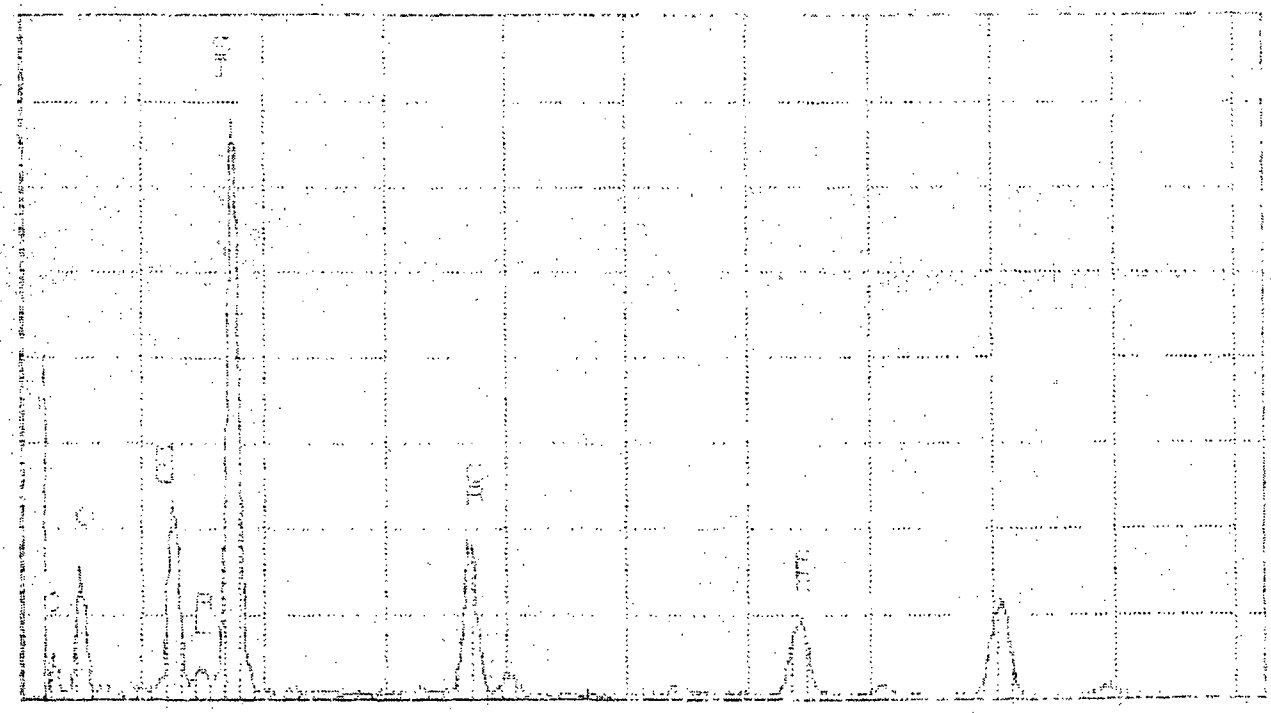


0.000 B- 5 Vert = 512 10.240
S 041210-09 020

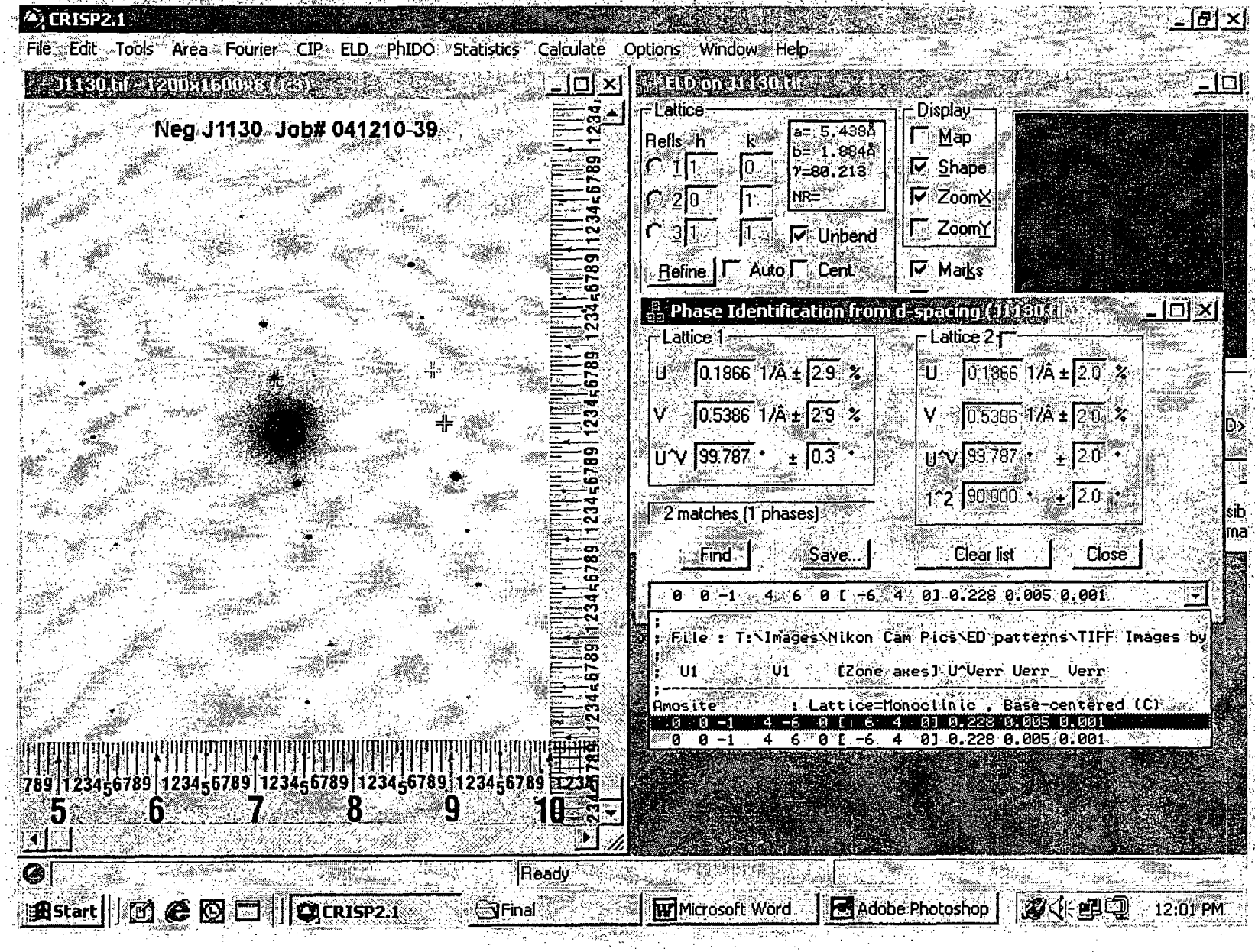
	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	58.91	Si+4	8.0000	8.0000							
Al2O3	1.08	Al+3	0.1923	0.0000	0.1923						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.26	Fe+3	0.0227			0.0227	0.0000				
MgO	14.21	Mg+2	2.9823			2.9823	0.0000				
MnO	0	Fe+2	1.4320			1.4320	0.0000				
CaO	12.73	Mn+2	0.0000			0.0000	0.0000				
Na2O	0.58	Ca+2	1.9229					1.9229	0.0000		
K2O	0.24	Na+	0.1945					0.0771	0.1174	0.1174	0.0000
		K+	0.0593							0.0593	0.0000
Total	100.01		Excess	T site	0.1923	C site	0.0000	B site	0.1173512	A site	0
			Total	8		4.6294		2.0000		0.1767	0.0000
			%Fill	100		92.5874		100			

Prefix none
Name actinolite
Modifier none
Group Calcic Amphibole

Sample # 041210-39-823

Values		Satisfied Conditions
(Ca,Na)@B	2.00	(Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.08	Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.92	(Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.18	Si > 7.5
Mg/(Mg+Fe2)	0.68	(Mg/(Mg+Fe2))< 0.9
Si	8.00	

Mineral Analysis Program (Version 5.0)


CRISP2.1
File Edit Tools Area Fourier CIP ELD PhIDO Statistics Calculate Options Window Help
J1130.tif - 1200x1600x8 (1:1)
Neg J1130 Job# 041210-39
ELD on J1130.tif
Lattice
Refls h k
1 1 0
2 0 1
3 1 1
a= 5.438Å
b= 1.884Å
γ=80.213
NR=
Unbend
Refine
Auto
Cent
Display
Map
Shape
ZoomX
ZoomY
Marks
Phase Identification from d-spacing (J1130.tif)
Lattice 1
U 0.1866 1/Å ± 2.9 %
V 0.5386 1/Å ± 2.9 %
U^V 99.787 ° ± 0.3 °
Lattice 2
U 0.1866 1/Å ± 2.0 %
V 0.5386 1/Å ± 2.0 %
U^V 99.787 ° ± 2.0 °
1^2 90.000 ° ± 2.0 °
2 matches (1 phases)
Find
Save...
Clear list
Close
0 0 -1 4 6 0 [-6 4 0] 0.228 0.005 0.001
; File : T:\Images\Nikon Cam Pics\ED patterns\TIFF Images by
; U1 V1 [Zone axes] U^Verr Uerr Verr
Amosite : Lattice=Monoclinic , Base-centered (C)
0 0 -1 4 -6 0 [6 4 0] 0.228 0.005 0.001
0 0 -1 4 6 0 [-6 4 0] 0.228 0.005 0.001
Ready
Start
CRISP2.1
Final
Microsoft Word
Adobe Photoshop
12:01 PM

SEMTEC QUANTITY
Standardless Analysis

Ref.1: _NAK" _NAK"
Ref.2: _ALK" _CAK" _HEK" _NAK _K [illegible]
Chi-sqd = 0.040

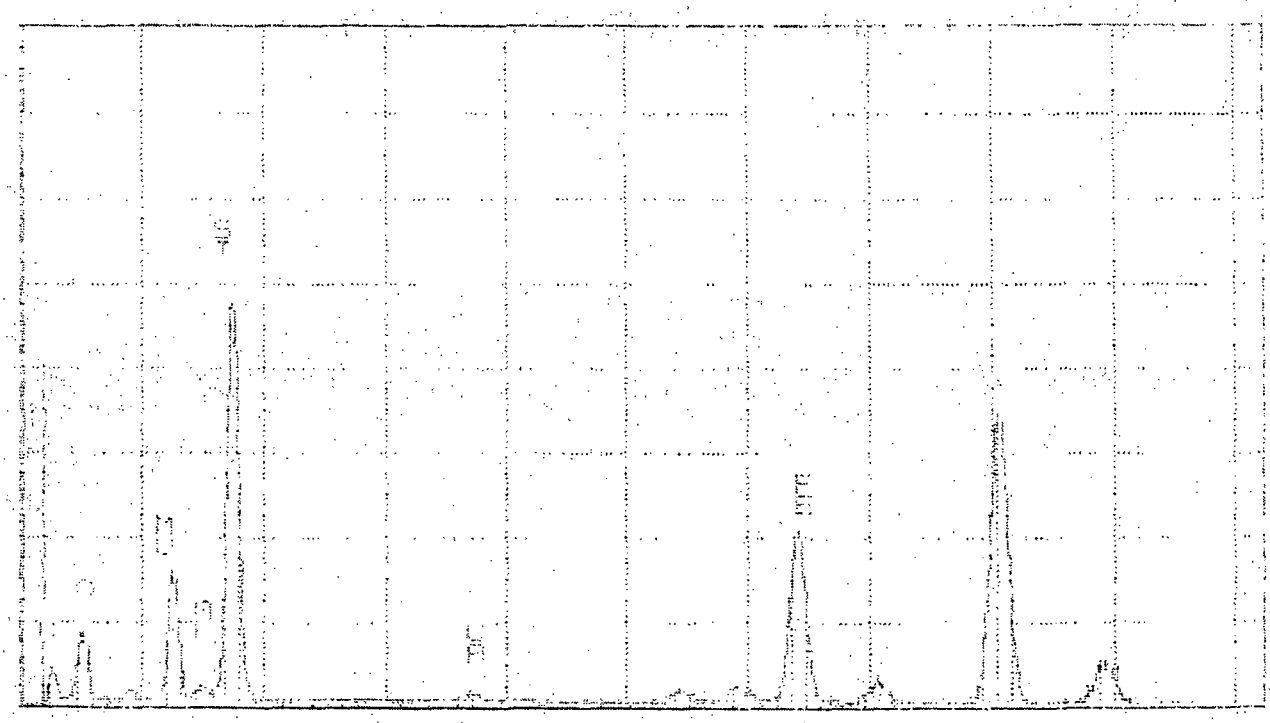
Element	Net Counts	
Si-K	7245 +/-	114
Fe-K	2245 +/-	9[illegible]
Al-K	1[illegible]8 +/-	104
Ca-K	184 +/-	[illegible]
Ferric Fe	[illegible]	94
Na-K	0 +/-	0
K-K	48 +/-	24

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	FORMULA
[illegible]	[illegible]	[illegible]	[illegible]	20.69	24.68	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	7.17	7.55	[illegible]	KOU
[illegible]	[illegible]	0.7[illegible]	[illegible]	[illegible]	0.95	[illegible]	[illegible]
[illegible]	164	0.949	0.926	2.37	[illegible]	[illegible]	CAO
[illegible]	[illegible]	[illegible]	0.096	[illegible]	22.[illegible]	31.40	[illegible]
[illegible]	0	0.519	[illegible]	0.00	[illegible]	[illegible]	NH2O
[illegible]	48	1.059	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
O			1.777	62.47	[illegible]		

TN-5500 University of Washington / JEOL WED 01-DEC-94 [illegible]
Cursor: 0.[illegible]keV = 0



0.000 0.5 Vis. = 17.74 10.140
42 04:21:18 SX 224

1,040

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	52.89	Si+4	7.8356	7.8356							
Al2O3	1.8	Al+3	0.3143	0.1644	0.1499						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	31.6	Fe+3	0.0000			0.0000	0.0000				
MgO	12.58	Mg+2	2.7785			2.7785	0.0000				
MnO	0	Fe+2	3.9146			2.0716	1.8430				
CaO	0.91	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	0.1444					0.1444	0.0000		
K2O	0.21	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0397							0.0397	0.0000
Total	99.99		Excess	T site	0.1499	C site	1.8430	B site	0	A site	0
			Total	8		5.0000		0.1444		0.0397	0.0000
			%Fill	100		100		7.22159			

Prefix none
Name grunerite, ferro-anthophyllite, ferroholmquistite, clinoferroholmquistite
Modifier none
Group Mg-Fe-Mn Amphibole

Sample # 041210-39-824

Values		Satisfied Conditions
(Ca,Na)@B	0.14	(Ca,Na)@B < 1 and (Mg,Fe2,Mn)@B >= 0.95
(Mg,Fe2,Mn)@B	1.84	(Mg/(Mg+Fe2))< 0.5
Mg/(Mg+Fe2)	0.42	Si > 7
Si	7.84	

Mineral Analysis Program (Version 5.0)