Muscovite analyses

	CMUS Ceylon		MMUS Madagascar	
SiO_2	45.26		44.47	
TiO_2	0.25		0.61	
Al_2O_3	34.38		27.48	
Fe_2O_3	1.70		5.09	
FeO	1.13		1.39	
MnO	0.020		0.90	
MgO	0.64		1.57	
CaO	0.055		0.070	
BaO	0.073		0.19	
Na_2O	1.13		0.86	
K_2O	9.73		10.32	
Rb_2O	0.076		0.070	
Cs_2O	0.002		0.003	
Li_2O	0.006		0.004	
F	0.15		0.14	
H_2O	5.16		5.58	
	99.762		98.747	
O=F	- 0.06		- 0.06	
Total	99.70		98.69	

Number of ions on the basis of 24(O,OH,F)

Si	6.0219	8.0000	6.1028	8.0000
Al	1.9781		1.8972	
Al	3.4130		2.5475	
Ti	.0250		.0630	
Fe^{3+}	.1702		.5256	
Fe	.1257	3.8631	.1595	3.7213
Mn	.0023		.1046	
Mg	.1269		.3211	
Ca	.0078		.0103	
Ba	.0038		.0102	
Na	.2915		.2288	
K	1.6514	1.9643	1.8066	2.0652
Rb	.0065		.0062	
Cs	.0001		.0009	
Li	.0032		.0022	
F	.0631	4.6426	.0607	5.1687
OH	4.5795		5.1080	

Andrew S. McCreath & Son, Inc.
ANALYTICAL AND CONSULTING CHEMISTS

236-242 Liberty St., Harrisburg, Pa. 17101
TELEX: 84-2321
CABLE: McCREATH
TELEPHONE: (717) 238-9331

April 17, 1979

Virginia Polytechnic Institute and State University
Geothermal Program
1046 Derring Hall
Blacksburg, Virginia 24061

Gentlemen:

The samples received from you January 29, 1979 contained dried at 105°C:

	Ceylon Muscovite	Madagascar Muscovite
Silica	45.26 per cent	44.47 per cent
Titania	0.25 " "	0.61 " "
Alumina	34.38 " "	27.48 " "
Ferric Oxide Fe_2O_3	1.70 " "	5.09 " "
Ferrous Oxide FeO	1.13 " "	1.39 " "
Manganous Oxide	0.020 " "	0.90 " "
Magnesia	0.64 " "	1.57 " "
Calcium Oxide	0.055 " "	0.070 " "
Barium Oxide	0.073 " "	0.19 " "
Sodium Oxide	1.13 " "	0.86 " "
Potassium Oxide	9.73 " "	10.32 " "
Rubidium Monoxide	0.076 " "	0.070 " "
Cesium Monoxide	0.002 " "	0.003 " "
Lithium Oxide	0.006 " "	0.004 " "
Fluorine	0.15 " "	0.14 " "
Combined Water	5.16 " "	5.58 " "
	99.76	98.75

Yours very truly,

ANDREW S. McCREATH & SON, INC.

P. Berdine Jr.

Andrew S. McCreath & Son, Inc.
ANALYTICAL AND CONSULTING CHEMISTS

236-242 Liberty St., Harrisburg, Pa. 17101
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April 18, 1979

Virginia Polytechnic Institute and State University
Geothermal Program
1046 Derring Hall
Blacksburg, Virginia 24061

SUBJECT: Outline of Methods

REFERENCE: Our Report dated April 17, 1979

Gentlemen:

Silica

Sodium Carbonate fusion; double perchloric acid dehydration.

Titania

Spectrophotometric - hydrogen peroxide.

Alumina

Aluminum hydroxide solution at pH 10.0 treated with potassium fluoride. The hydroxide equivalent to the aluminum titrated with standard hydrochloric acid.

Ferric Oxide

Total iron found by potassium dichromate titration minus the iron found in the Ferrous Oxide determination.

Ferrous Oxide

Sample treated with hydrofluoric acid and sulfuric acids in presence of standard Cerate solution. The excess Cerate titrated with standard ferrous sulfate using ferroin as indicator.

Manganous Oxide - Magnesia -
Calcium Oxide - Barium Oxide

Sample opened with hydrofluoric acid, nitric acid and perchloric acid. Analysis by atomic absorption in 5% hydrochloric acid.

Sodium Oxide - Potassium Oxide - Rubidium
Monoxide - Cesium Monoxide - Lithium Oxide

Sample opened with hydrofluoric acid, nitric acid, and perchloric acid. Analysis by flame emission.

Fluoride

Willard Winter Distillation. Fluoride determined in the distillate using fluoride specific ion electrode.

Combined Water

Sample heated at 1000°C in a tube furnace using argon carrier gas. Water absorbed in magnesium perchlorate.

SUPER RECAL

MUSCOVITE ANALYSES

	1		2	
SIO2	45.26		44.47	
TIO2	0.25		0.61	
A203	34.38		27.48	
F203	1.70		5.09	
FEO	1.13		1.39	
MNO	0.02		0.90	
MGO	0.64		1.57	
CAO	0.05		0.07	
BAO	0.07		0.19	
NA2O	1.13		0.86	
K2O	9.73		10.32	
F	0.15		0.14	
H2O	5.16		5.58	
SUM	99.68		98.67	
-O= F	0.06		0.06	
SUM	99.61		98.61	

SI	6.023	*	6.104	*
AL	1.977	8.000	1.896	8.000
AL	3.414	*	2.548	*
FE3+	0.170	*	0.526	*
FE	0.126	*	0.160	*
MN	0.002	*	0.105	*
MG	0.127	*	0.321	*
TI	0.025	3.864	0.063	3.722
CA	0.008	*	0.010	*
BA	0.004	*	0.010	*
NA	0.292	*	0.229	*
K	1.651	1.955	1.807	2.056
H	4.580	*	5.109	*
F	0.063	4.643	0.061	5.170
O	24.000	*	24.000	*
F/M		1.008		0.823
F/FM		0.502		0.451

1 CEYLON MUSCOVITE

DATA REDUCTION BY METHOD OF BENCE & ALBEE:

ON SPECIMEN: CEYLON MUSCOVITE

ELEMENT		WEIGHT% (OXIDE)	STD.DEVI. (PERCENT)	FORMULA	K-RATIO	UNKN PEAK (COUNTS)	UNKN BKGD (COUNTS)	COUNTING TIME(SEC
TI	KA	0.000	53.11	0.000	0.0000	442.2	500.0	10.00
MN	KA	0.000	494.04	0.000	0.0000	67.6	70.0	10.00
NA	KA	0.643	4.88	0.182	0.0525	542.7	38.0	10.00
CA	KA	0.004	345.76	0.001	0.0002	205.8	200.0	10.00
SI	KA	46.759	1.83	6.807	1.0828	6295.2	20.0	10.00
AL	KA	35.382	2.08	6.070	0.9703	4563.4	10.0	10.00
K	KA	9.665	1.03	1.795	0.6474	15999.9	150.0	10.00
MG	KA	0.214	14.68	0.046	0.0047	222.4	100.0	10.00
FE	KA	2.015	4.08	0.245	0.0277	810.2	73.0	10.00

TOTAL 94.683 24.000 OXYGENS ITERATIONS= 3

07-FEB-79 10:10:31

ANOTHER PT (Y,YES,K,NO) ?

INPUT SAMPLE DESCRIPTION (<CR> FOR NO CHANGE)?

MADAGASCAR MUSCOVITE

SELECT ANALYSIS POSITION AND PUSH BUTTON WHEN READY

DATA REDUCTION BY METHOD OF BENCE & ALBEE:

ON SPECIMEN: MADAGASCAR MUSCOVITE

ELEMENT		WEIGHT% (OXIDE)	STD.DEVI. (PERCENT)	FORMULA	K-RATIO	UNKN PEAK (COUNTS)	UNKN BKGD (COUNTS)	COUNTING TIME(SEC
TI	KA	0.479	6.42	0.055	0.0120	1130.8	500.0	10.00
MN	KA	0.077	54.29	0.010	0.0046	93.6	70.0	10.00
NA	KA	0.355	7.02	0.105	0.0277	304.2	38.0	10.00
CA	KA	0.001	1215.06	0.000	0.0001	201.6	200.0	10.00
SI	KA	45.765	1.83	6.964	1.0714	6229.0	20.0	10.00
AL	KA	28.920	2.22	5.187	0.7717	3631.5	10.0	10.00
K	KA	10.868	0.99	2.110	0.7324	18080.4	150.0	10.00
MG	KA	1.501	3.90	0.340	0.0317	934.3	100.0	10.00
FE	KA	5.694	2.34	0.725	0.0785	2164.8	73.0	10.00
TOTAL		93.660		24.000	OXYGENS	ITERATIONS= 3		

07-FEB-79 10:12:08

ANOTHER PT (Y,YES,K,NO) ?

DATA REDUCTION BY METHOD OF BENCE & ALBEE:

ON SPECIMEN: CEYLON MUSCOVITE

ELEMENT		WEIGHT% (OXIDE)	STD.DEVI. (PERCENT)	FORMULA	K-RATIO	UNKN PEAK (COUNTS)	UNKN BKGD (COUNTS)	COUNTIN TIME(SE
TI	KA	0.000	44.99	0.000	0.0000			
MN	KA	0.036	110.98	0.004	0.0022	432.1	500.0	10.00
NA	KA	0.775	4.42	0.217	0.0632	81.1	70.0	10.00
CA	KA	0.000	124.58	0.000	0.0000	646.2	38.0	10.00
SI	KA	46.759	1.83	6.757	1.0822	184.3	200.0	10.00
AL	KA	35.876	2.08	6.110	0.9836	6291.8	20.0	10.00
K	KA	10.102	1.01	1.862	0.6769	4625.6	10.0	10.00
MG	KA	0.209	14.98	0.045	0.0045	16722.7	150.0	10.00
FE	KA	1.929	4.18	0.233	0.0265	219.4	100.0	10.00
						778.9	73.0	10.00
TOTAL		95.686		24.000	OXYGENS			

ITERATIONS= 3

07-FEB-79 10:08:28

ANOTHER PT (Y,YES,K,NO) ?K
ANOTHER PT (Y,YES,K,NO) ?Y

SELECT ANALYSIS POSITION AND PUSH BUTTON WHEN READY