

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Tabulation of modal and chemical analyses for
Silver Plume Quartz Monzonite (Silver Plume Granite),
Berthoud Plutonic Suite, Front Range, Colorado

by

Dolores J. Gable¹

Open-File Report 85-296

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

¹ Denver Federal Center

Tabulation of modal and chemical analyses for
Silver Plume Quartz Monzonite (Silver Plume Granite),
Berthoud Plutonic Suite, Front Range, Colorado

By

By Dolores J. Gable

In the Berthoud Plutonic Suite twenty-nine new whole rock and semiquantative spectrographic analyses and seventy modal analyses have been determined (tables 1 and 2). These are representative of Silver Plume Quartz Monzonite and are from the Indian Creek plutons and Longs Peak-St. Vrain, Cripple Creek, and Kenosha batholiths of the Colorado Front Range (figure attached). Only chemically analyzed samples are shown on this figure; all others are located by descriptive location only (p.2-4). Longs Peak-St. Vrain data and the Tungsten dike samples were collected while field mapping in both the southern part of the Longs Peak-St. Vrain batholith and in the Tungsten area. All other samples were collected using maps already available.

Locations for modes listed on table 2

Indian Creek plutons

Conifer quadrangle

- C-1: T. 5 S., R. 71 W., on north-south line dividing NW 1/4 and NE 1/4 of the SW 1/4 of sec 29.
- C-2 : T. 5 S., R. 70 W., NW 1/4 of the SW 1/4 of sec 29.
- C-2A: Same location as C-2.
- C-2B: Same location as C-2.
- C-5 : T. 6 S., R. 71 W., NW 1/4 of the NW 1/4 of sec 21.
- C-6 : T. 6 S., R. 70 W., SE 1/4 of the SW 1/4 of sec 19.

Evergreen quadrangle

- E-2A: T. 5 S., R. 71 W., NE 1/4 of the NW 1/4 of sec 2.

Pine quadrangle

- P-1: T. 7 S., R. 71 W., on south line separating NW 1/4 and NE 1/4 of sec 1
- P-2: T. 7 S., R. 71 W., NW 1/4 of the SW 1/4 of sec 1.

Cripple Creek batholith

Cripple Creek quadrangle

- CR-1: T. 15 S., R. 70 W., on N-S line dividing NE 1/4 and SW 1/4 of sec 25.
- CR-3: T. 15 S., R. 70 W., SW 1/4 of the SW 1/4 of sec 25.

Cover Mountain quadrangle

- CM-1: T. 15 S., R. 71 W., center of SE 1/4 of sec 4.
- CM-2: T. 16 S., R. 71 W., SE 1/4 of the SW 1/4 of sec 26.
- CM-3: T. 16 S., R. 71 W., SW 1/4 of the SW 1/4 of sec 30.

Kenosha batholith

Mount Logan quadrangle

- K-1: T. 7 S., R. 74 W. due south of sec 6 along highway.

Jefferson quadrangle

- K-3: T. 7 S., R. 75 W., south half of east N-S section line sec 15.
- K-4: T. 7 S., R. 75 W., center of sec 27.

Observatory Rock quadrangle

- K-5: T. 9 S., R. 75 W., SE 1/4 of the NW 1/4 of sec 1.
- K-6: T. 9 S., R. 75 W., SW 1/4 of the SE 1/4 of sec 2.

Milligan Lakes quadrangle

- K-7: T. 8 S., R. 75 W., NW 1/4 of the SW 1/4 of sec 35.
- K-8: T. 8 S., R. 75 W., SW 1/4 of the SE 1/4 of sec 27.

Longs Peak-St Vrain batholith and adjacent lens and dikes

Raymond quadrangle

- R-2: T. 2 N., R. 72 W., NE 1/4 of the SW 1/4 of sec 5.
Core samples R-N from hole 24m and 105m in depth.
Core samples R-S from hole 33m and 105m in depth.

Locations for modes listed on table 2 (cont'd)

Longs Peak-St Vrain batholith and adjacent lenses and dikes (cont'd)

Monarch Lake quadrangle

ML-14A: Lat. $40^{\circ}02'00''$, Long. $105^{\circ}40'10''$.
 223: Lat. $40^{\circ}03'00''$, Long. $105^{\circ}39'30''$.
 358: T. 2 N., R. 7 $\frac{1}{2}$ W., center E-W line on north side of sec 24.
 425: Lat. $40^{\circ}04'30''$, Long. $105^{\circ}37'35''$.
 R-055: Lat. $40^{\circ}07'00''$, Long. $105^{\circ}38'00''$.

Isolation Peak quadrangle

373: Lat. $40^{\circ}07'10''$, Long. $105^{\circ}42'40''$.

East Portal quadrangle

472: Lat. $39^{\circ}59'00''$, Long. $105^{\circ}42'00''$.
 R-241: Lat. $40^{\circ}00'00''$, Long. $105^{\circ}41'30''$.
 R-247: Lat. $39^{\circ}58'00''$, Long. $105^{\circ}41'30''$.

Ward quadrangle

254: Lat. $40^{\circ}05'30''$, Long. $105^{\circ}37'00''$.
 262: Lat. $40^{\circ}05'45''$, Long. $105^{\circ}37'30''$.
 R-058: Lat. $40^{\circ}07'15''$, Long. $105^{\circ}37'25''$.
 W257-70: Lat. $40^{\circ}03'00''$, Long. $105^{\circ}36'30''$.
 W267-70: Lat. $40^{\circ}03'00''$, Long. $105^{\circ}37'00''$.
 WH1-71: Lat. $40^{\circ}06'00''$, Long. $105^{\circ}36'10''$.
 W81-71: T. 1 N., R. 7 $\frac{1}{2}$ W., NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ sec 11.
 W150-71: Lat. $40^{\circ}04'00''$, Long. $105^{\circ}37'00''$.
 W186-71: Lat. $40^{\circ}06'00''$, Long. $105^{\circ}35'00''$.
 W218-71: Lat. $40^{\circ}05'00''$, Long. $105^{\circ}37'15''$.
 W275-71: Lat. $40^{\circ}05'45''$, Long. $105^{\circ}37'25''$.
 W287-71: T. 1 N., R. 7 $\frac{1}{2}$ W., NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of sec 7.
 W15-72: T. 2 N., R. 7 $\frac{1}{2}$ W., NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of sec 30.
 W20-72: T. 2 N., R. 7 $\frac{1}{2}$ W., SE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of sec 24.
 W47-72: Lat. $40^{\circ}05'45''$, Long. $105^{\circ}33'15''$.
 W1-73: Lat. $40^{\circ}05'45''$, Long. $105^{\circ}34'30''$.
 W5-73: Lat. $40^{\circ}06'30''$, Long. $105^{\circ}36'15''$.
 W12A-73: Lat. $40^{\circ}06'15''$, Long. $105^{\circ}35'15''$.
 W13A-73: Lat. $40^{\circ}06'15''$, Long. $105^{\circ}35'15''$.

Gold Hill quadrangle

GH25-71: T. 1 N., R. 7 $\frac{1}{2}$ W., NE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of sec 8.
 GH65-72: T. 1 N., R. 7 $\frac{1}{2}$ W., NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of sec 32.
 GH170-73: T. 1 N., R. 7 $\frac{1}{2}$ W., SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of sec 29.
 GH177-73: T. 1 N., R. 7 $\frac{1}{2}$ W., SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of sec 29.
 GH353-74: T. 1 N., R. 7 $\frac{1}{2}$ W., NW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of sec 19.
 GHB35-75: T. 1 N., R. 7 $\frac{1}{2}$ W., NW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of sec 1.
 GH200-75: T. 2 N., R. 7 $\frac{1}{2}$ W., SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of sec 36.
 GH278-75: T. 1 N., R. 7 $\frac{1}{2}$ W., on E-W line of NW $\frac{1}{4}$ and SW $\frac{1}{4}$ of sec 4.
 GH289-75: T. 1 N., R. 7 $\frac{1}{2}$ W., NW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of sec 4.
 GH300-75: T. 1 N., R. 7 $\frac{1}{2}$ W., SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of sec 5.
 GH329-75: T. 2 N., R. 7 $\frac{1}{2}$ W., SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of sec 31.
 GH339A-75: T. 2 N., R. 7 $\frac{1}{2}$ W., SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of sec 33.
 GH 13A-76: T. 2 N., R. 7 $\frac{1}{2}$ W., NE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of sec 24.

Locations for modes listed on table 2 (cont'd)

Longs Peak-St Vrain batholith and adjacent lenses and dikes (cont'd)

Gold Hill quadrangle (cont'd)

GH 28A-76: T. 2 N., R. 72 W., SE 1/4 of the SE 1/4 of sec 23.
GH50-76: T. 2 N., R. 71 W., NE 1/4 of the SE 1/4 of sec 19.
GH68-76: T. 2 N., R. 71 W., SE 1/4 of the SE 1/4 of sec 30.
GH115-76: T. 2 N., R. 72 W., NW 1/4 of the NW 1/4 of sec 24.
GH215-76: T. 2 N., R. 72 W., NE 1/4 of the SE 1/4 of sec 26.
GH241-76: T. 2 N., R. 72 W., SE 1/4 of the NW 1/4 of sec 29.
GH325-67: T. 2 N., R. 73 W., NW 1/4 of the NE 1/4 of sec 29.
GH373-76: T. 2 N., R. 73 W., SE 1/4 of the SW 1/4 of sec 29.

Other Lens and Dikes

Tungsten quadrangle

Ty-144: T. 1 S., R. 72 W., NE 1/4 of the NW 1/4 of sec 4.
Ty-194: T. 1 S., R. 72 W., NE 1/4 of the NE 1/4 of sec 5.
T-485-67: T. 1 S., R. 72 W., NW 1/4 of the SE 1/4 of sec 2.
T-134-68: T. 1 S., R. 72 W., NE 1/4 of the SE 1/4 of sec 27.
T-183-68: T. 1 S., R. 71 W., NE 1/4 of the SE 1/4 of sec 6.
T-244-68: T. 2 S., R. 72 W., SW 1/4 of the NE 1/4 of sec 14.
T-384b-68: T. 1 S., R. 72 W., SW 1/4 of the SW 1/4 of sec 13.
T 395-68: T. 1 S., R. 71 W., NE 1/4 of the SW 1/4 of sec 18.

TABLE 2.--Additional modes, in volume percent for Silver Plume Quartz Monzonite,
Longs Peak-St.Vrain batholith and satellitic lens and dikes, Colorado.--Continued
[tr., trace; --, not found]

Indian Peaks Area (samples from Pearson, 1980; Modes by Gable)																	
Raymond quadrangle																	
Field No.	Core samples (R-N)		Core samples (R-S)		MU-14A												
	R-2	24 meters and 105 meters	33 meters and 105 meters	33 meters and 105 meters		254	262	358	373	425	472	R-241	R-247	R-055	R-058		
Potassium feldspar	45.7	39.0	28.7	38.0	26.0	34.4	32.0	25.9	40.5	35.7	35.5	32.9	40.3	38.4	46.3	31.7	25.2
Plagioclase	23.3	26.0	27.3	26.0	27.0	34.1	29.1	40.6	20.4	24.3	30.0	21.1	21.3	30.0	19.2	27.5	36.8
Quartz	24.1	29.0	37.8	31.0	38.0	26.8	29.9	18.9	32.4	31.0	27.5	39.2	29.8	29.7	25.8	34.8	34.4
Biotite	4.3	2.0	.4	--	3.0	.1	4.3	11.4	5.0	5.1	--	4.3	3.9	.6	4.7	.7	--
Muscovite/sericite	.8	2.0	.8	1.0	1.0	.6	3.4	.7	.5	2.1	1.2	1.7	3.5	.5	3.8	2.2	.5
Ores	1.1	tr.	.1	tr.	1.0	.3	1.1	2.3	.1	.6	.8	.4	.3	.3	.1	.5	tr.
Zircon	tr.	tr.	.1	--	--	tr.	tr.	tr.	tr.	tr.	tr.	--	--	--	--	--	tr.
Garnet	--	--	.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sillimanite	tr.	tr.	1.1	1.0	2.0	--	.2	--	tr.	.3	--	.1	.5	--	--	.4	tr.
Chlorite	.6	2.0	2.3	3.0	2.0	3.4	--	--	.9	.6	5.0	--	.1	--	.1	2.2	3.1
Rutile	--	tr.	.3	tr.	tr.	tr.	--	--	tr.	tr.	tr.	--	--	--	--	tr.	--
Calcite	--	--	.1	tr.	tr.	tr.	--	--	.2	--	--	--	--	--	--	--	--
Apatite	.1	--	--	--	--	--	--	.1	--	.3	tr.	--	--	tr.	--	--	tr.
Monazite	tr.	--	--	tr.	tr.	.3	tr.	.1	tr.	tr.	tr.	.3	.1	tr.	tr.	tr.	tr.
Spinel	--	--	--	--	tr.	tr.	--	--	--	--	--	--	--	--	--	--	--
Allanite	--	--	--	--	--	--	--	--	--	--	--	tr.	tr.	--	--	--	--
Epidote	--	--	--	--	--	--	--	--	--	--	--	--	.2	.5	--	--	--

TABLE 2.--Additional modes, in volume percent for Silver Plume Quartz Monzonite,
Longs Peak-St. Vrain batholith and satellitic lens and dikes, Colorado.--Continued
[tr., trace; --, not found]

Ward quadrangle																
Field No.	W257-70	W267-70	W81-71	W81-71	W150-71	W186-71	W218-71	W275-71	W287-71	W15-72	W20-72	W47-72	W1-73	W5-73	W12A-73	W13A-73
Potassium feldspar	55.2	43.7	48.2	36.0	2.3	41.6	43.3	36.2	57.0	24.7	40.3	tr.	46.8	tr.	54.9	--
Plagioclase	16.6	15.4	17.3	27.0	83.0	23.0	26.6	29.0	6.4	36.0	20.5	54.7	19.5	50.2	8.8	45.0
Quartz	18.9	34.2	28.6	28.0	2.6	26.5	21.8	25.8	29.5	28.2	29.0	26.1	28.5	26.7	29.5	34.5
Biotite	8.6	4.2	2.8	4.0	8.9	3.9	5.2	4.0	2.1	9.2	6.2	16.2	4.6	20.0	3.0	15.4
Muscovite/sericite	--	.4	.9	2.0	--	3.9	1.2	4.7	2.1	.7	.3	.3	--	.4	1.9	.5
Ors	.7	.4	.7	1.0	2.4	1.0	.9	tr.	.7	1.2	tr.	1.1	.3	.6	.1	.3
Zircon	tr.	--	--	tr.	tr.	tr.	--	--	tr.	tr.	--	tr.	--	tr.	--	tr.
Garnet	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.0
Sillimanite	tr.	.8	.2	1.0	--	--	.3	.3	.4	--	3.0	--	.3	--	.3	--
Chlorite	--	--	1.2	1.0	tr.	--	.3	--	1.8	--	.7	--	--	.8	--	--
Rutile	--	--	--	--	tr.	--	--	--	--	tr.	--	--	--	tr.	--	--
Calcite	--	--	--	--	--	--	tr.	--	--	--	--	--	--	--	--	--
Apatite	tr.	--	tr.	tr.	.4	--	.4	--	--	--	--	tr.	--	1.0	--	.3
Monazite	tr.	tr.	.1	tr.	tr.	.1	tr.	tr.	tr.	tr.	tr.	--	tr.	--	tr.	--
Spinel	--	--	--	--	--	--	--	--	--	--	--	--	tr.	--	--	--
Allanite	--	--	--	--	--	--	--	--	--	--	--	--	--	tr.	--	--
Epidote	tr.	--	--	--	tr.	--	--	--	--	tr.	--	1.6	--	.3	--	--
Sphene	--	--	--	--	.4	--	--	--	--	--	--	--	--	--	--	--
Andalusite	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5	--

TABLE 2.—Additional modes, in volume percent, for Silver Plume Quartz Monzonite in the Indian Creek plutons and Cripple Creek and Kenosha batholith, Front Range Colorado—Continued
[tr., trace; —, not found]

Field No.	Indian Creek plutons					Cripple Creek batholith			Cripple Creek batholith			Kenosha batholith								
	C-1	C-2	Canifer quadrangle C-28	C-5	C-6	Evergreen quadrangle E-2A	Pine quadrangle P-1	P-2	Cripple Creek quadrangle CR-1	Cripple Creek quadrangle CR-3	Cover Mountain quadrangle CM-1	CM-2	CM-3	R-1	R-3	R-4	R-5	R-6	R-7	R-8
Potassium feldspar	27.6	35.2	40.8	25.5	26.3	31.2	32.6	33.9	31.5	39.9	28.2	26.8	33.9	39.4	37.5	25.7	32.4	32.3	38.2	14.5
Plagioclase	36.7	30.4	19.3	30.3	34.8	31.4	35.5	27.7	32.5	26.1	34.2	38.2	31.6	26.8	27.7	38.5	31.1	31.5	23.8	25.2
Quartz	28.8	25.1	31.6	36.8	26.9	24.7	29.3	35.7	27.7	27.3	29.9	27.3	26.9	26.2	30.4	27.7	23.5	27.4	31.3	30.4
Biotite	4.2	5.6	3.7	4.5	10.0	8.0	1.4	2.2	4.8	1.5	3.6	4.9	5.1	3.6	2.3	2.8	10.6	2.8	1.2	4.9
Muscovite/sericite	1.6	3.6	4.1	2.8	1.5	4.3	.6	.1	3.0	1.6	3.7	2.5	2.5	3.5	1.9	3.9	2.3	5.6	5.3	4.4
Oras	.9	tr.	.5	tr.	.1	tr.	.3	.1	.4	3.4	.4	.2	tr.	.5	.2	1.5	tr.	.5	.2	.6
Zircon	tr.	tr.	—	tr.	tr.	.1	tr.	—	—	.1	tr.	tr.	—	—	tr.	—	.1	tr.	tr.	tr.
Garnet	—	—	—	—	—	—	—	—	—	—	—	tr.	—	—	—	—	—	—	—	—
Sillimanite	—	—	—	—	—	—	—	—	—	—	—	—	—	tr.	tr.	tr.	tr.	—	tr.	tr.
Chlorite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	tr.	tr.	—	tr.	—	—
Rutile	—	—	—	—	—	—	—	—	—	—	—	—	—	—	tr.	tr.	—	tr.	—	—
Apatite	—	—	—	—	.3	—	.3	—	tr.	—	—	—	—	—	—	—	.1	tr.	—	—
Monazite	.2	.1	—	.1	.1	.3	tr.	.3	.1	—	tr.	—	tr.	tr.	tr.	—	tr.	.1	—	tr.
Allanite	—	—	—	—	—	.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluorite	—	—	—	—	—	—	tr.	—	—	.1	—	—	—	—	—	—	—	—	—	—
Tourmaline	—	—	—	—	—	—	—	—	—	—	—	—	—	tr.	—	—	—	tr.	—	—

TABLE 2.—Additional modes, in volume percent for Silver Plume Quartz Monzonite, Longs Peak-St. Vrain batholith and asthenitic lens and dike, Colorado.
[tr., trace] —, not found]

Field No.	CH25-71	CH65-72	CH170-73	CH177-73	CH33-75	CH44-75	CH200-75	CH278-75	CH289-75	CH300-75	CH329-75	CH339-75	CH13-76	CH28A-76	CH50-76	CH68-76	CH115-76	CH215-76	CH241-76	CH315-76	CH375-76
Pecanum feldspar	.1	44.9	16.4	40.5	44.3	28.0	30.8	35.2	48.3	33.9	0	28.0	31.7	23.1	23.7	38.4	31.1	22.7	35.7	12.9	36.8
Plagioclase	56.1	19.0	42.0	24.6	20.5	36.0	31.5	35.4	22.7	29.7	52.4	26.4	22.8	28.7	52.1	21.0	30.2	27.2	26.2	41.5	30.5
Quartz	22.4	27.5	26.9	24.6	30.0	31.5	28.5	20.6	20.7	27.7	27.0	41.0	29.6	26.0	34.4	29.0	28.1	38.8	30.8	26.4	28.3
Biotite	19.3	5.0	12.8	9.3	3.7	1.5	7.6	1.0	5.9	6.8	18.0	2.0	5.4	8.7	.1	1.4	5.1	9.5	4.6	12.8	—
Muscovite/sericite	tr.	1.3	.8	.2	1.0	.4	.4	1.0	1.8	.5	—	.2	8.5	10.2	9.3	8.1	4.6	1.5	1.3	.3	.1
Orss	.6	1.4	.9	.3	.7	1.3	1.2	1.0	.5	.8	2.1	1.2	1.9	.9	.4	2.1	.9	.2	.4	2.7	1.4
Zircon	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.	tr.
Garnet	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sillimanite	tr.	.7	—	—	—	.1	tr.	—	.1	.5	—	—	—	—	—	—	—	—	.7	—	—
Chlorite	.7	.5	—	—	tr.	1.2	.1	5.2	—	.1	—	1.2	—	—	—	—	—	—	—	—	2.1
Rutile	—	tr.	—	—	—	—	—	.5	—	tr.	.5	tr.	—	—	—	—	—	—	tr.	—	—
Apatite	.4	.1	.2	.5	tr.	—	.1	tr.	—	—	tr.	tr.	tr.	.4	—	—	tr.	.1	.3	1.2	—
Monazite	tr.	—	tr.	—	tr.	tr.	tr.	tr.	tr.	tr.	tr.	—	.1	tr.	—	—	—	tr.	tr.	—	—
Spinel	—	—	—	—	—	—	—	—	tr.	—	—	—	—	—	—	—	—	—	—	—	tr.
Epidote	—	—	—	—	—	—	—	—	—	—	tr.	—	—	—	—	—	—	—	—	—	—
Sphene	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.2	.8

TABLE 2.--Additional modes, in volume percent, for Silver Plume Quartz Monzonite lens and dikes, Tungsten quadrangle, Colorado.--Continued
[tr., trace; n.d., not determined]

Field No.	Ty-144	Ty-194	T-485-67	T-134-68	Tl83-68	T-244-68	T-384b-68	T-395-68
Potassium feldspar	41.5	37.0	39.4	41.4	42.9	28.1	36.6	46.4
Plagioclase	21.8	25.4	20.3	23.8	23.4	33.2	25.7	20.5
Quartz	23.9	31.1	29.5	27.2	24.3	23.9	25.1	25.5
Biotite	7.0	4.7	4.4	5.1	1.3	9.7	6.9	4.7
Muscovite/sericite	3.6	.3	4.6	.6	2.6	2.0	1.8	1.8
Iron oxides	1.5	.6	1.2	1.5	4.8	1.7	2.8	.4
Apatite	.4	.1	.1	.2	.2	.7	.3	.5
Sphene	--	tr.	--	--	--	--	--	--
Zircon	.1	tr.	tr.	tr.	tr.	.2	.1	tr.
Monazite	--	--	--	--	--	--	--	tr.
Allanite	.1	--	--	.2	tr.	.4	.7	.2
Chlorite	--	.4	.5	tr.	.5	.1	--	tr.
Calcite	--	--	--	--	tr.	--	--	--
Rutile	--	--	--	--	tr.	--	--	tr.
Epidote	.1	.4	--	--	--	tr.	--	--
Composition of plagioclase-----	An ₂₅	An ₂₈	n.d.	n.d	n.d.	n.d.	n.d.	n.d.