# IGNEOUS ROCKS OF THE CAPITAN QUADRANGLE, NEW MEXICO, AND VICINITY

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ABSTRACT

Igneous rocks are extensively exposed in the Capitan quadrangle, occurring in the mountain masses of Carrizo, Patos, Capitan, Vera Cruz, and Sierra Blanca Mountains, and in numerous dikes, sills and extrusions throughout the quadrangle.

This paper presents the results of quantitative mineralogical studies of igneous rocks from different parts of the quadrangle and from a few localities adjacent to it.

The Capitan quadrangle is in central New Mexico. It lies between the parallels 33°30′ and 33°45′ and the meridians 105°30′ and 105°45′.

The Capitan Mountains extend into the east central part of the quadrangle and the Sierra Blanca enter it in the southwest. Carrizo and Patos Mountains occupy the northwest corner of the quadrangle, and the Vera Cruz Mountains are in the west central part.

Igneous rocks are found extensively in the quadrangle occurring in the mountain masses and in dikes, sills, and extrusive flows in different parts of the quadrangle.

This paper embodies the results of micrometric studies of the different igneous rocks of the quadrangle and vicinity.

In making these studies measurements were made by means of a Wentworth recording micrometer, fifteen traverses being made for each thin section. Universal stage methods were used in determining the plagioclase feldspars.

Rock classifications are according to Johannsen's system of quantitative mineralogical classification of igneous rocks.[1]

## PLUTONIC ROCKS

*Modes of Kalialaskites*

| | 1 % | 2 % | 3 % | 4 % | 5 % |
|---|---|---|---|---|---|
| Potash feldspar | 71.2 | 75.2 | 71.5 | 72.6 | 80.4 |
| Quartz | 27.2 | 24.2 | 27.2 | 26.7 | 17.4 |
| Magnetite and hematite | 1.6 | 0.5 | 1.0 | 0.6 | 0.9 |
| Biotite | | | | | 0.8 |

[1] Johannsen, A. (1939), Descriptive Petrography of Igneous Rocks: Chicago, Univ. of Chicago Press.

| | 6 % | 7 % |
|---|---|---|
| Potash feldspar | 88.3 | 83.0 |
| Quartz | 8.1 | 16.5 |
| Magnetite | 1.6 | |
| Biotite | 1.7 | |
| Hornblende | 0.3 | |
| Dark constituents | | 0.2 |

1. Center of NE ¼ Sec. 25 T7S R14E, north side of Capitan Mountains.
2. Sec. 18 T8S R15E, southwest side of Capitan Mountains.
3. West side of pass through Capitan Mountains, east part of Capitan Mountains quadrangle.
4. Center of Sec. 25 T7S R14E, Capitan Mountains southwest of Encinoza.
5. Main ledge of west facing cliff of Vera Cruz Mountains.
6. Summit of White Mountain, Sierra Blanca southwest of quadrangle.
7. West end of Capitan Mountains, NE ¼ Sec. 13 T8S R14E.

Modes of Alaskite

| | 1 % |
|---|---|
| Potash feldspar | 71.8 |
| Quartz | 22.1 |
| Dark constituents | 6.0 |

1. Gum Spring Canyon west central part of Capitan Mountains quadrangle.

*Modes of Orthosites*

| | 1 % | 2 % | 3 % |
|---|---|---|---|
| Potash feldspar | 95.0 | 91.2 | 91.7 |
| Quartz | 3.6 | 3.8 | 3.7 |
| Dark constituents | 1.2 | | |
| Biotite | | 1.3 | 1.2 |
| Oligoclase | | 0.2 | 0.5 |
| Hornblende | | 1.9 | 2.5 |
| Magnetite | | 1.3 | 0.1 |
| Apatite | | 0.3 | 0.1 |

1. South side of Patos Mountain SW ¼ Sec. 3 T7S R13E.
2. Sec. 30 T7S R13E. Powell Canyon, Carrizo Mountain.
3. NW ¼ Sec. 19 T7S R13E. Base of cliff head of Powell Canyon, Carrizo Mountain.

## Hypabyssal Rocks

*Modes of Kalialaskite Porphyry*

| | 1<br>% |
|---|---|
| Potash feldspar | 89.0 |
| Quartz | 8.9 |
| Magnetite | 1.8 |
| Biotite | 0.3 |

1. NE ¼ Sec. 28 T9S R14E. Dike in bottom of small creek tributary to Salado Creek. This is representative of many dikes of the quadrangle.

*Modes of Diabase Porphyries*

| | 1<br>% | 2<br>% | 3<br>% | 4<br>% | 5<br>% | 6<br>% |
|---|---|---|---|---|---|---|
| Labradorite | 83.7 | 91.5 | 89.5 | 77.5 | 73.6 | 58.4 |
| Augite | 8.3 | 1.8 | 7.4 | 19.2 | 16.3 | 41.1 |
| Chlorite | 3.7 | 1.0 | 0.1 | 0.4 | 6.3 | |
| Magnetite | 4.3 | 5.2 | 2.7 | 2.6 | 3.8 | 9.5 |
| Apatite | | 0.5 | 0.1 | | | |

1. SE corner of NW ¼ of SE ¼ Sec. 17 T8S R14E.
2. NE ¼ of Sec. 29 T9S R13E.
3. Center of Sec. 31 T8S R14E, 2.4 miles northwest of Capitan on U. S. Highway 380.
4. SE ¼ Sec. 31 T8S R14E, 2 miles northwest of Capitan on U. S. Highway 380.
5. Dike in valley of tributary to Aragon Creek NE ¼ Sec. 22 T7S R14E.
6. NE ¼ Sec. 8 TS9 R14E, 0.4 miles west of Capitan.

*Modes of Diabases*

| | 1<br>% | 2<br>% |
|---|---|---|
| Labradorite | 73.8 | 84.5 |
| Chlorite | 5.7 | 2.4 |
| Augite | 10.8 | 7.9 |
| Magnetite | | 4.7 |
| Hornblende | 7.6 | |
| Pyrite | 1.8 | |
| Illmenite, Magnetite and Leucoxene | 0.3 | |

1. Dike south central border NW ¼ Sec. 24 T8S R13E, one mile northeast of Indian Divide.
2. SE ¼ Sec. 2 T9S R13E.

*Modes of Meladiabase*

| | 1<br>% |
|---|---|
| Labradorite | 43.4 |
| Augite | 52.2 |
| Magnetite | 4.2 |

1. East part of Sec. 13 T7S R14E.

## Extrusive Rocks

### *Kalitordrillites*

A type of igneous rock occurring in this quadrangle is a very fine grained rock with practically no dark constituents. In thin section these rocks are seen to have the same minerals and in approximately the same proportion as kalialaskite. They are, therefore, classed as kalitordrillites, extrusive equivalents of kalialaskites.

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