per cent and the species name saléeite to the half in which P>As in atomic per cent. A specimen near the phosphate end of the series has been analyzed (Thoreau and Vaes, 1932, p. 96; Mrose, 1950, p. 528), but no specimens near the arsenate end of the series have been analyzed. A semiquantitative spectrographic analysis of the New Mexico material (by C. S. Annell, of the U. S. Geological Survey) indicated $As_2O_5$ in the greater-than-10-per cent bracket, but $P_2O_5$ was not observed in any bracket down to a sensitivity limit of 0.1 per cent. The amount of material present in this specimen was not sufficient for a quantitative chemical analysis.

The $x$-ray powder pattern of novacekite differs from the patterns of saléeite and arsenian saléeite only by its slightly larger unit-cell dimensions. The unit-cell dimensions of arsenian saléeite are $a_0=7.05$Å, $c_0=19.87$ Å and of novacekite, $a_0=7.20$ Å, $c_0=20.22$ Å.

Optically this material is anomalously biaxial negative with $\alpha=1.625$, $\beta=1.641$, $\gamma=1.641$, and 2V 5 to 20°. This specimen is pleochroic with X colorless, Y pale yellow green, and Z pale yellow green. Its specific gravity is 3.7. The mineral fluoresces bright lemon yellow in both short and long wavelength ultraviolet radiation.

This work was completed as part of a program undertaken by the U. S. Geological Survey on behalf of the Division of Raw Materials of the Atomic Energy Commission.

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## ARROJADITE IS A FERROAN DICKINSONITE

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While working on classifying my $x$-ray powder films of the pegmatite phosphate minerals, it was recently noted that arrojadite from the Black Hills and dickinsonite from Branchville, Conn., yielded substantially identical results. In her recent paper (3) Mrs. Lindberg compared the powder photos of arrojadite with those from a number of other pegmatite phosphates, but not with dickinsonite. Figure 1 shows prints from my two films.

TABLE 1. CHEMICAL ANALYSES

| | Dickinsonite | | | Arrojadite | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| $K_2O$ | 1.52 | 1.80 | 1.73 | 1.74 | 2.00 | 1.45 |
| $CaO$ | 2.15 | 2.09 | 2.01 | 2.46 | 5.53 | 5.69 |
| $Na_2O$ | 7.46 | 7.37 | 7.41 | 6.40 | 7.46 | 4.67 |
| $MnO$ | 31.58 | 31.83 | 31.83 | 15.78 | 15.54 | 12.33 |
| $FeO$ | 13.25 | 12.96 | 12.33 | 28.22 | 25.05 | 19.84 |
| $Fe_2O_3$ | | | | none | none | 12.39 |
| $MgO$ | tr | none | 1.67 | 1.04 | 1.50 | 1.85 |
| $Li_2O$ | 0.17 | 0.22 | 0.20 | 0.09 | 0.28 | tr |
| $SnO_2$ | | | | | | 1.52 |
| $Al_2O_3$ | | | | 2.66 | | |
| $P_2O_5$ | 39.57 | 40.89 | 40.78 | 40.00 | 38.64 | 34.32 |
| $H_2O$ | 1.65 | 1.63 | 1.82 | 0.91 | 0.73 | 5.40 |
| F | | | | 0.80 | 0.69 | |
| Insol. | 2.58 | 0.82 | 1.00 | 0.11 | 2.47 | 0.66 |
| Total | 99.93 | 99.61 | 100.78 | 100.21 | 99.89 | 100.12 |
| Less O=F | | | | 0.34 | 0.23 | |
| | | | | 99.87 | 99.66 | |

1–2. Dickinsonite, Branchville, Conn. Wells, *Am. Jour. Sci.*, **39**, 213 (1890).
3. Dickinsonite, Poland, Me. Gonyer, *Am. Mineral.*, **15**, 381 (1930).
4. Arrojadite, Black Hills. Lindberg, *Am. Mineral.*, **35**, 69 (1950).
5. Arrojadite, Black Hills. Headden (see Lindberg).
6. Arrojadite, Serra Branca. Guimarães (see Lindberg, p. 68).

Table 1 lists chemical analyses of the two minerals taken from the literature. Particular attention is called to nos. 3 & 4, since they represent the only available modern analyses of fresh material. These are very similar if it is noted that $MnO + FeO = 44.08 \pm 0.08$.

Crystallographic data taken from Wolfe (4) and Mrs. Lindberg are as follows:

TABLE 2

| | Space Group | $a_0$ | $b_0$ | $c_0$ | $\beta$ | Volume | Meas. Grav. |
|---|---|---|---|---|---|---|---|
| Dickinsonite | $C\,2/c$ | 16.70 | 9.95 | 24.69 | 104°41′ | 3968 | 3.55 |
| Arrojadite | $C\,2/m$ | 16.60 | 10.02 | 23.99 | 93°37′ | 3982 | 3.42 |

The only serious discrepancy is in the $\beta$-angle; the writer expects to do single crystal work to check these values.

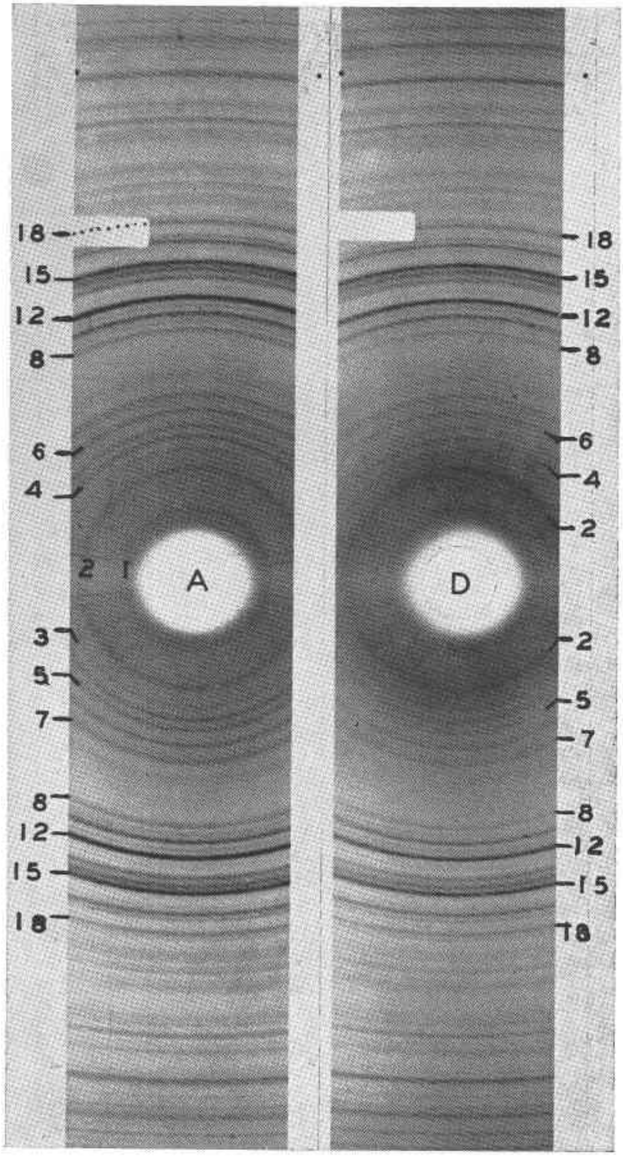


FIG. 1. *X*-ray powder photos, Fe radiation (Mn filter), 114.6 mm. diam. camera, natural scale. Some of the lines are numbered as in Table 3.

*A*—Arrojadite, Nickel Plate Mine, Black Hills, South Dakota. The crushed sample (prepared from a specimen in the Headden Collection of Harvard University) was kindly supplied by M. L. Lindberg of the U. S. Geological Survey.

*D*—Dickinsonite, Branchville, Conn. The sample is from Yale University (Brush Coll. #3090) through the courtesy of Professor Horace Winchell. It consists of dark green platy crystals lining a small vug in lithiophilite (altered to sicklerite near the vug).

TABLE 3. ARROJADITE *X*-RAY DATA (SEE FIG. 1)

| No. | Lindberg (3) | | Fisher* | | | |
|---|---|---|---|---|---|---|
| | $I$ | $d$ | $I$ | $d_{meas.}$ | $d_{calc.}$ | Indices |
| 1 | 2 | 12.14 | 2 | 11.82 | 11.92 | 002 |
| 2 | 3 | 7.62 | 3 | 7.62 | 7.59 | 201† |
| | 1 | 7.12 | | | | |
| 3 | 2 | 6.52 | 2 | 6.48 | 6.51 | 202 |
| 4 | 4 | 5.93 | 4 | 5.93 | 5.96 | 004 |
| | | | | | 5.90 | $\bar{2}03$, $\bar{1}13$ |
| 5 | 4 | 5.54 | 3 | 5.52 | 5.50 | 203, 104‡ |
| | | | | | 5.48 | 300 |
| 6 | 3 | 5.01 | 4 | 4.99 | 5.01 | 020, $\bar{2}04$‡ |
| | | | | | 4.96 | $\bar{1}14$ |
| 7 | 3 | 4.58 | 3 | 4.58 | | |
| 7*a* | 1 | 4.23 | (Skip one faint line) | | | |
| | 1 | 3.84 | | | | |
| 8 | 3 | 3.42 | 3 | 3.410 | | |
| 9 | 1 | 3.33 | 1 | 3.313 | | |
| 10 | 6 | 3.22 | 7 | 3.212 | | |
| 11 | 2 | 3.13 | 1 | 3.118 | | |
| 12 | 10 | 3.04 | 10 | 3.037 | | |
| 13 | 4 | 2.85 | 5 | 2.846 | | |
| 14 | 4 | 2.77 | 5 | 2.766 | | |
| 15 | 8 | 2.72 | 9 | 2.703 | | |
| | 1 | 2.68 | (skip 2 faint lines) | | | |
| | 1 | 2.59 | | | | |
| 16 | 3 | 2.56 | 5 | 2.553 | | |
| 17 | 2 | 2.518 | 2 | 2.505 | | |
| 18 | 2 | 2.424 | 4 | 2.415 | | |

* Spacings measured by Leon Atlas; indices computed by A. A. Forslev using the technique of Bloss (1) and the cell data of Lindberg (3).

† 201 is an impossible reflection according to the space group criteria of Wolfe (4) for dickinsonite from Poland, Me.; so are $\bar{2}03$ and 203.

‡ These two indices are impossible reflections according to space group criteria.

The formulas given (using one of the alternatives listed by Mrs. Lindberg) are as follows:

| | |
|---|---|
| *Dickinsonite* System II 718 (from Wolfe) | $4[H_2Na_6(Mn, Fe, Ca, Mg)_{14}(PO_4)_{12} \cdot H_2O]$ |
| *Arrojadite* System II 680 | $12[Na_2(Fe'', Mn'')_5(PO_4)_4]$ |
| Lindberg | $4[(Na, K)_5(Fe, Mn, Ca)_{16}(PO_4)_{12}(F, OH) \cdot H_2O]$. |

These will be discussed in a later report.

The optical data (2) agree in showing $\alpha \sim\!\!\to [b]$, a very large 2V, and for dickinsonite $\beta \wedge [c] = +15°$, while for arrojadite $\beta \wedge [c] = +21°$; indices of refraction are a bit higher in arrojadite, as is to be expected from its higher iron content.

It is concluded that the name *arrojadite* should be dropped in favor of *ferroan dickinsonite*, since the latter term has a 47-year priority.

*Note:* The indices and calculated spacings listed in Table 3 are erroneous, since they are based on an incorrect unit cell. Wolfe has chosen the correct cell, but his numerical results are slightly small; $\beta$ is 105°52′.

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## Meteoritics: The Journal of the Meteoritical Society and the Institute of Meteoritics of the University of New Mexico

From the time of the inception of the Meteoritical Society in 1933, its *Notes* and *Contributions* were published regularly in the monthly magazine, *Popular Astronomy*, until December, 1951, when that periodical was discontinued on the completion of its 59th volume. By arrangement with the University of New Mexico and by unanimous vote of the Council of the Society, a new publication entitled *Meteoritics: The Journal of the Meteoritical Society and the Institute of Meteoritics of the University of New Mexico* was established, and its premier issue, consisting of 25 items and 123 pages, appeared in December, 1953, as Volume 1, Number 1, Whole Number 1, 1953.

*Meteoritics* is to be issued at least once but not more than four times a year. It is expected that eventually the journal will become a quarterly. Each volume is intended to contain from 240 to 360 pages. The Editor of the Meteoritical Society, Dr. Frederick C. Leonard of the University of California, Los Angeles, is the Editor of *Meteoritics*, and the Director of the Institute of Meteoritics of the University of New Mexico, Dr. Lincoln La Paz, is the Associate Editor.