

AMERICAN MUSEUM NOVITATES

Number 372
Published by
THE AMERICAN MUSEUM OF NATURAL HISTORY
New York City

Sept. 28, 1929

54.9.3 (74.9)

A CRYSTALLOGRAPHIC NOTE ON GREENOCKITE FROM WEST PATERSON, NEW JERSEY

BY HERBERT P. WHITLOCK

The specimen which furnished the basis for this note was brought to the writer for identification in the fall of 1925 by Captain Thomas I. Miller, who obtained it for this purpose from the owner, a Paterson local collector. It was found in the Lower Quarry, at that time operated by Ferguson Bros. at West Paterson. Captain Miller stated that several small, isolated crystals had been obtained by the local collectors, who had assumed that they were wurtzite. The specimen consisted of a small but unusually well developed crystal of hexagonal hemimorphic symmetry, transparent, dark reddish brown in color, and measuring 2 mm. in diameter. The crystal was implanted on a rounded aggregate of light green prehnite in such a manner as to expose the planes of the posterior termination, which was uppermost, and to render practicable the measurement of these planes in four of the six sextants.

In the course of the identification of this crystal, measurement on a Goldschmidt 2-circle goniometer was resorted to, when it became apparent that the narrow limits of the ρ readings, using the perfectly reflecting basal plane for orientation, definitely identified the crystal as greenockite rather than wurtzite.

The following forms were observed on the posterior termination: o (0001), m ($10\bar{1}0$), k ($20\bar{2}3$), r ($10\bar{1}1$), s ($20\bar{2}1$) and z ($11\bar{2}1$).

Figure 1 shows the proportional development of these planes in ideal representation. No measurements could be made of the anterior termination, owing to the position of the crystal with respect to the matrix; it was assumed, however, on a basis of surface markings, that the pyramid of the anterior termination was r ($10\bar{1}1$), as represented in the figure.

The ρ angles measured on the occurring pyramids in four of the six sextants were as follows:

For s ($20\bar{2}1$); $61^\circ 55'$, $61^\circ 56'$, $61^\circ 55'$, $61^\circ 54'$.

For r ($10\bar{1}1$); $43^\circ 8'$, $43^\circ 4'$, $43^\circ 6'$, $43^\circ 6'$.

For k ($20\bar{2}3$); $32^\circ 7'$, $32^\circ 1'$, $31^\circ 57'$, $31^\circ 51'$.

For z ($11\bar{2}1$); $58^\circ 22'$, $58^\circ 25'$, $58^\circ 24'$, $58^\circ 24'$.

From these 16 readings, values of p_0 were calculated which gave as an average $p_0 = .93705$ with limits of .93908 and .93468, or about $\pm .002$. This value of p_0 corresponds to an axial ratio $a:c = 1:0.8115$. The value of p_0 for greenockite, as given in Goldschmidt's "Krystallographische Winkeltabellen," is $p_0 = .9374$. For wurtzite $p_0 = .9442$.

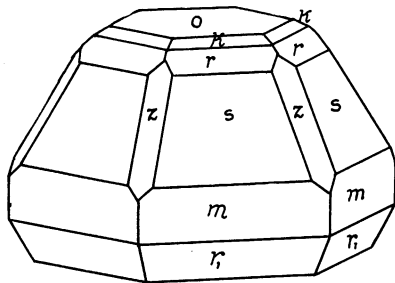


Fig. 1

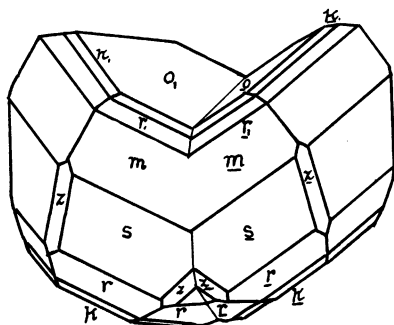


Fig. 2

A specimen from the Paterson quarry which was loaned to the writer for further study by Mr. James F. Morton, of the Paterson Museum, showed several small crystals of greenockite, one of which was twinned parallel to z ($11\bar{2}1$). This constitutes a new twinning law for greenockite, since no twin crystals of this species have been hitherto observed. Figure 2 shows this twinning habit drawn in ideal proportions.