XXXIV.—*Crystallography of the Monhydrated Mercurous Nitrite.*

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THE crystals supplied me by Dr. Rây are lemon-yellow, and seldom exceed 3 mm. in length. Their small size, delicacy, and tendency to rapid decomposition in the warm, moist atmosphere of this climate, rendered their manipulation for crystallographic measurement a matter of considerable difficulty. As a rule, too, only the faces on one side of the crystal—the free-growing surface—exhibited a sufficiently high lustre for work with the reflecting goniometer; continuous work in one zone, therefore, was possible only to a limited degree. I believe, however, that the results recorded are correct to within 6' of arc, which will be sufficiently precise for the recognition of similar forms on crystals of isomorphous compounds which may be produced in future researches.

The crystals belong to the triclinic system, and generally exhibit only the four forms represented by the eight faces shown in Fig. 1.

FIG. 1.

The angles between the normals to these faces are as follows:—

$$\begin{array}{ll} am = 59^{\circ} 41'. & ac = 83^{\circ} 20'. \\ mc = 61^{\circ} 22'. & pc = 42^{\circ} 57'. \\ pa = 61^{\circ} 11'. & pm' = 96^{\circ} 33'. \end{array}$$

From these measurements, *c* and *a* will naturally be selected as pinacoids, of which *c* will conveniently be the basal plane, but the angle between the faces *a* and *m* is so wide that it seems unadvisable to select *m* as the other vertical pinacoid. Its relations to *a* agree more nearly with the faces generally regarded as prisms (∞P), and this arrangement receives additional support from the appearance of

faces which appear to be the corresponding prism faces on some very minute crystals which I have examined under the microscope, but

FIG. 2.

which are far too small for goniometric work. Fig. 3 is a projection of one of these small crystals on a plane perpendicular to the vertical

FIG. 3.

crystallographic axis. By comparing it with Fig. 2, which is a similar projection of the commoner type of crystal, and which I have examined goniometrically, it will be seen that the traces of a second prism face are shown as well as the plan of a dome-face in the zone of α . I have carefully examined all the crystals at my disposal in hopes of finding a face which might conveniently be taken as the other vertical pinacoid, b , but, so far, without success. To select the face m for this purpose would give a most unusually great inclination of the crystallographic axes, and I have, therefore, deferred the calculation of these angles, and consequently of the axial ratios, until further material may reveal some new combinations. The drawings, therefore, represent the average proportions of the crystals, and the faces represented may provisionally be regarded as—

- c = basal plane (001).
- α = macropinacoid (100).
- m = prism ($1\bar{1}0$).
- p = pyramid (111).

The angular relations between the normals to these faces will be sufficient at least for their identification by future workers.

Dr. Rây has called my attention to the statement in Fremy's *Encyclopédie Chimique* (vol. iii., 1889, p. 382), according to which silver nitrite crystallises in oblique prisms with an angle of 59° —a result not very different from the angle between the faces α , m in this compound. But Dr. Rây's analyses indicate the presence in this compound of half a molecule of water.

Examination of the crystals under the microscope shows numerous minute liquid inclusions with a zonal arrangement. Determinations of the specific gravity of the compound would, therefore, be of little

scientific value. The crystals exhibit strong double refraction when examined between crossed Nicols, and macropinacoidal sections show an extinction angle of 33° to the vertical crystallographic axis. It would be interesting, should further researches reveal any isomorphous compounds of similar habit, to ascertain the position of the optic axial plane, as the optical constants of compounds, both natural and artificial, appear to be very sensitive to small changes in chemical composition.