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ANKERITE FROM SANDHURST, VICTORIA.

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AMONG the specimens of minerals in the Museum Collection are two, which were obtained from the New Chum line of reef, Sandhurst, Victoria, and which had been placed among those of the Calcite group. That these were correctly named seemed doubtful, as the powdered mineral effervesced very feebly with dilute hydrochloric acid in the cold. A qualitative test showed that both iron and magnesia were present in considerable quantity and a complete analysis furnished the following results :—

$CaCO_3$	48·95
$FeCO_3$	23·12
$MgCO_3$	25·01
Insoluble residue ...	3·54
	100·62

·3016 gram of material was taken for analysis, which on treating with hydrochloric acid, left ·0107 gram of insoluble matter consisting mainly of albite. By subtracting this insoluble portion from the total quantity taken, namely ·3016 gram, and calculating the results on the amount dissolved, that is ·2909 gram, the percentage composition of the three carbonates is found to be :—

$CaCO_3$	50·76
$FeCO_3$	23·97
$MgCO_3$	25·93

Manganese was not present, neither the borax bead test nor the fusion with nitre and caustic potash giving the manganese reaction.

The specific gravity of the mineral is 2·994 (uncorr.) and its hardness about 3·5.

The crystals consist of very flat rhombohedrons with slightly curved faces occasionally striated, and form the lenticular crystals with sharp edges frequently seen in calcite and more especially in siderite. They are, however, externally slightly altered and the

surfaces have a dull yellowish tinge deepening occasionally towards the edges. Internally they are colourless and translucent and shew the rhomboidal cleavage perfectly.

In the one specimen the crystals of ankerite are associated with large and well formed crystals of quartz, some of which are left-handed, having both the rhombo- and trapezohedral surfaces. A few saddle-shaped crystals of siderite are deposited here and there on both minerals.*

The other specimen contains no siderite, the associated minerals being quartz crystals, and a few large and numerous small crystals of albite.

Normal ankerite has the formula $2\ CaCO_3.FeCO_3.MgCO_3$ assigned to it and requires

$2\ CaCO_3$	50·0
$FeCO_3$	29·0
$MgCO_3$	21·0
	100·0

The analysis of the above mineral is seen to differ from this in the relative proportions of the carbonates of iron and magnesia. Calculated however for the formula $5\ CaCO_3.2\ FeCO_3.3\ MgCO_3$ the percentages found agree exceedingly well with the theoretical

	Calculated.	Found.
$5\ CaCO_3$	50·81	50·76
$2\ FeCO_3$	23·57	23·97
$3\ MgCO_3$	25·61	25·93

Boricky† writes the formula for ankerite and similar minerals thus :—

$$(CaFeC_2O_6) + n\ (CaMgC_2O_6),$$

and states that n may vary from $\frac{1}{2}$ to 10. When n is 1 the formula represents normal ankerite, but he assumes that those minerals in which n is 2 or less may be classed as ankerites, while he names those in which n is greater than 2 parankerites. The formula $5\ CaCO_3.2\ FeCO_3.3\ MgCO_3$ calculated for the present mineral may be written :—

$$2\ (CaFeC_2O_6) + 3\ (CaMgC_2O_6)$$

* These crystals of siderite have already been figured and described by the late Mr. F. Ratte in "Notes from the Australian Museum," Proc. Linn. Soc. N. S. Wales, x., 4, 1885, p. 759.

† Boricky—Min. Mitth., xlvii., 1876.

and this again :—

$$(CaFeC_2O_6) + \tfrac{3}{2}\,(CaMgC_2O_6)$$

in which it is seen that n is equal to $\frac{3}{2}$. This mineral therefore, according to Boricky's nomenclature, must be placed with the ankerites, but differs from the normal however in that n is $\frac{3}{2}$ instead of 1.

In Australia generally this mineral has been rarely observed. In New South Wales, Queensland, and Tasmania it has not been recorded. In Victoria, A. R. C. Selwyn and G. H. F. Ulrich* state that a mineral similar in composition was met with in veins and patches in decomposed basalt at Philip Island; and in South Australia it has been found at Gill's Bluff, near Lyndhurst, and at the Wallaroo Mine. Brown spar and ferrocalcite have been observed in several places, but they vary very considerably in composition from ankerite itself.

* A. R C. Selwyn and G. H. F. Ulrich—Phys. Geogr., Geol. and Min. Vict., 1866, p. 75.