

AN
ELEMENTARY INTRODUCTION

TO
MINERALOGY,

BY THE LATE

WILLIAM PHILLIPS.

New Edition,

WITH EXTENSIVE ALTERATIONS AND ADDITIONS,

BY

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LONDON:

LONGMAN, BROWN, GREEN, AND LONGMANS; SIMPKIN, MARSHALL, AND
CO.; F. AND J. RIVINGTON; WHITTAKER AND CO.; TEGG AND CO.;
AND D. BOGUE.

1852.

parent in a direction perpendicular to *b*. Lustre on *b* pearly; the other faces adamantine, inclining to vitreous. Red of various shades, grey, green. The red varieties incline to blue when viewed in a direction perpendicular to *b*. Streak peach-blossom-red. Sectile. In thin plates flexible. $H = 1.5 \dots 2.0$. The lowest degree of hardness on *b*. $G = 2.9 \dots 3.1$.

In the matrass gives off water and turns blue, but yields no sublimate. The red varieties from Schneeberg become green. Before the blowpipe on charcoal emits arsenical vapours, and melts in the inner flame into a blackish-grey globule of arsenide of cobalt. Imparts a smalt blue colour to glass of borax. Soluble in hydrochloric acid, forming a rose-red solution. Becomes black when digested in potash.

$\text{Ca}^{\text{As}} + 8\text{H}$, oxide of cobalt 37.56, arsenious acid 38.39, water 24.05.

Analyses of erythrine from Schneeberg by Kersten:—

Arsenic acid	38.43	38.30	38.10
Oxide of cobalt	36.52	33.42	29.19
Protoxide of iron	1.01	4.01	—
Lime	—	—	8.00
Water	24.10	24.08	28.90

In attached acicular crystals, elongated in the direction of the edge *a*, *b*; botryoidal; coating other minerals in the state of a red powder. Occurs usually in beds and veins with other ores of cobalt.

Is found at Schneeberg and Annaberg in Saxony, Joachimsthal in Bohemia, Saalfeld and Glücksbrunn in Thuringia, Riechelsdorf and Bieber in Hesse, Wolfach and Wittichen in Baden, Allemont in Dauphiné, St. Jean in the valley of Gistain in the Pyrenees, Modum in Norway.

331. ANNABERGITE. — Arseniate of nickel; Phillips. Nickel arseniaté; Hauy. Nickelblüthe; Hausmann. Nickelocher; Haidinger.

Oblique. Apparently isomorphous with erythrine and vivianite.

b 010.

Cleavage. *b*, very perfect. Green of various shades. Streak greenish-white. $H = 2.5 \dots 3.0$. $G = 3.078 \dots 3.181$.

In the matrass yields water. Before the blowpipe on charcoal emits fumes of arsenic, and melts into a bead of arsenide of nickel. Soluble in nitric acid.

$\text{Ni}^{\text{As}} + 8\text{H}$, arsenic acid 38·37, oxide of nickel 37·59, water 24·04.

Analyses of annabergite *a* from Riechelsdorf by Stromeyer, *b* from Allemont by Berthier, *c*, *d*, *e* from Schneeberg by Kersten:—

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
Arsenic acid	36·97	36·8	38·30	38·90	37·21
Sulphuric acid	0·23	arsenious acid		0·43	
Oxide of nickel	37·35	36·2	36·20	35·00	36·10
Oxide of cobalt	—	2·5	1·53	—	—
Protoxide of iron	1·13	—	—	2·21	1·10
Water	24·32	25·5	23·91	24·02	23·72

In capillary crystals; compact; earthy. It is a product of the decomposition of various ores containing nickel and arsenic.

Is found at Andreasberg in the Harz, Riechelsdorf and Bieber in Hessa, Glücksbrum and Saalfeld in Thuringia, Annaberg, Schneeberg and some other places in Saxony, Joachimsthal in Bohemia, Allemont in Dauphiné, Texas.

332. KÖTTIGITE.—Köttigite; Dana.

Oblique. Apparently isomorphous with erythrine and vianite.

Cleavage. *b*, very perfect. Translucent. Lustre of surface of fracture silky. Light carmine-red...peach-blossom-red. Streak reddish-white. $\text{H} = 2·5 \dots 3·0$. $\text{G} = 3·1$.

In the matrass yields water and assumes a pale smalt blue colour. Before the blowpipe on charcoal in the outer flame fuses, emits fumes of arsenic, and leaves a slag of oxide of zinc. Yields the reactions of cobalt and nickel. Is soluble in acids.

$\text{Zn}^{\text{As}} + 8\text{H}$, part of the oxide of zinc being replaced by oxides of cobalt and nickel.

Analysis by Kötting:—

Arsenic acid (loss)	37·17
Oxide of zinc	30·52
Oxide of cobalt	6·91
Oxide of nickel	2·00
Lime	trace
Water	23·40

Is found in fibrous crystalline crusts and massive, with smaltine in the Daniel mine near Schneeberg.