THE SYSTEM OF

MINERALOGY

of James Dwight Dana and Edward Salisbury Dana
Yale University 1837–1892

SEVENTH EDITION
Entirely Rewritten and Greatly Enlarged

By
CHARLES PALACHE
the late HARRY BERMAN
and CLIFFORD FRONDEL
Harvard University

VOLUME II

HALIDES, NITRATES, BORATES, CARBONATES,
SULFATES, PHOSPHATES, ARSENATES, TUNGSTATES,
MOLYBDATES, ETC.

JOHN WILEY AND SONS, INC.
NEW YORK LONDON SYDNEY


17. Mellor (12, 432, 1932); Hintze (1927); Biltz, *Zs. anorg. Chem.*, 220, 321 (1934).


**Cryst.** Hexagonal—R; hexagonal-scalenoahedral—3 2/m.

\[ a:c = 1:0.81; \quad \alpha = 103°21'; \quad p_0 : r_0 = 0.94:1; \quad \lambda = 72°32' \]

**Forms:**

\[ c \quad 0001 \quad 111 \quad m \cdot 40\bar{1}1 \quad 3\bar{1} \bar{1} \quad w \quad 0773 \quad 10.10.11 \]

\[ p \quad 1011 \quad 100 \quad \bar{p} \cdot 0221 \quad 111 \quad \bar{w} \quad 0881 \quad 325 \]

**Structure cell.** Space group \( R\bar{3}c \). \( a_{1h} = 5.72; \quad \alpha = 48°14'; \quad a_0 = 4.67 \text{kX}, \quad c_0 = 15.13; \quad a_0 : c_0 = 1:3.24. \) Cell contains \( \text{Co}_2(\text{CO}_3)_2 \) in the rhombohedral unit.

**Habit.** Crystals rare. As small spherical masses, with a crystalline surface and concentric and radiated structure; as crusts.


**Opt.**

\[ n (\text{Boleo}) \quad \text{Dichroism} \]

\[ O \quad 1.855 \pm 0.005 \quad \text{Violet-red} \quad \text{Uniaxial negative} \ (\text{–}). \]

\[ E \quad 1.60 \pm 0.01 \quad \text{Rose-red} \]

**Chem.** Cobalt carbonate, \( \text{CoCO}_3 \). Small amounts of Ni, Fe\( ''\), Ca, and Cu (\(?\)) occur in substitution for Co.

**Anal.**

<table>
<thead>
<tr>
<th>Anal.</th>
<th>CoO</th>
<th>NiO</th>
<th>FeO</th>
<th>CaO</th>
<th>CuO</th>
<th>CO₂</th>
<th>Rem.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>63.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37.00</td>
<td>100.00</td>
</tr>
<tr>
<td>2.</td>
<td>88.86</td>
<td></td>
<td></td>
<td>1.80</td>
<td></td>
<td></td>
<td>34.65</td>
<td>99.94</td>
</tr>
<tr>
<td>3.</td>
<td>59.68</td>
<td>0.90</td>
<td>0.18</td>
<td>2.87</td>
<td></td>
<td>[36.12]</td>
<td>0.25</td>
<td>[100.00]</td>
</tr>
<tr>
<td>4.</td>
<td>55.72</td>
<td>1.21</td>
<td></td>
<td>3.12</td>
<td>1.95</td>
<td>35.87</td>
<td>1.57</td>
<td>99.44</td>
</tr>
</tbody>
</table>

1. CoCO₃. 2. Schneeberg. Rem. is Fe₂O₃ 3.41, H₂O 1.22. Oxidized ferroan material? 3. Libiola, Italy. Rem. is H₂O. 4. Valle del Neva, Italy. Rem. is Fe₂O₃ 0.27, H₂O 1.30, MnO and MgO tr.

Occur. Originally found at Schneeberg, Saxony, with roselite, erythrite, and annabergite in the Co-Ni veins. From Libiola near Casarza and Valle del Neva, in Liguria, Italy. In dolomite at the Étoile du Congo mine and elsewhere in the Katanga district, Belgian Congo, and in the Jervois Range in Central Australia. From Boleo, Lower California.

Alter. To stainerite.

Artif. As microscopic rhombohedral crystals by heating CoCl$_2$ with carbonates at 150° in a closed tube. Several different hydrates of CoCO$_3$ are known.

Name. Sphaerocobaltite in allusion to the spheroidal shape and the composition. This name is unsatisfactory because of the suggested relation to cobaltite and the use of the mode of aggregation as a species rather than as a varietal designation and is here replaced by the name cobaltocalcite.

Ref.
1. Elements of the structure cell of Baccaredda, Acc. Linc., Rend., 16, 248 (1932), but with $c$ quartered to conform to the morphological unit used for the calcite group.
2. Pelloux, Ann. museo civico stor. nat. Genoa, 52, 269 (1927), who states that the angles are close to those of siderite.
3. Baccaredda (1932) [analysis 4]. Ferrari and Colla, Acc. Linc., Rend., 10, 594 (1929), obtained a cell with $a = 5.91$ kX, $a = 103°21'$ on artificial material.
4. Larsen (135, 1921).
5. Weisbach (1877).
8. de Sémaumont, Ann. Chem. Pharm., 80, 216 (1851); C.R., 32, 409 (1851); and Mellor (14, 808, 1885).


Supposedly a cobalt carbonate found as earthy, rose-colored incrustations on serpentite at a copper mine at Finksburg, Carroll County, Maryland. Apparently a serpentinite-like mineral stained with cobalt and not a valid species.

Ref.


Crystal. Hexagonal—$R$; hexagonal-scalenohedral—$\overline{3} 2/m$.

$\alpha:c = 1:0.8063$; $a = 103°28'$; $p_0:v_0 = 0.9311:1$; $\lambda = 72°20'$