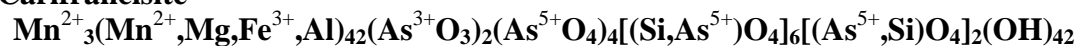


Carlfrancisite



Crystal Data: Hexagonal. *Point Group:* $\bar{3} 2/m$. As curved platy aggregates to ~2 cm.

Physical Properties: *Cleavage:* Perfect on {001}. *Fracture:* Hackly. *Tenacity:* Brittle. Hardness = 3 D(meas.) = n.d. D(calc.) = 3.620

Optical Properties: Translucent. *Color:* Yellowy orange to pale yellow. *Streak:* Very pale yellow. *Luster:* Vitreous to opalescent.

Optical Class: Uniaxial (+). $\epsilon = 1.756(2)$ $\omega = 1.758(2)$

Cell Data: *Space Group:* $R\bar{3}c$. $a = 8.2238(2)$ $c = 205.113(6)$ $Z = 6$

X-ray Powder Pattern: Kombat mine, Otavi Valley, Namibia.

2.826 (100), 2.371 (88), 1.552 (84), 2.676 (63), 3.243 (54), 4.107 (48), 2.918 (47)

Chemistry:	(1)
As ₂ O ₅	13.07
As ₂ O ₃	3.18
P ₂ O ₅	0.50
V ₂ O ₅	0.74
SiO ₂	8.96
Al ₂ O ₃	0.78
FeO	0.22
MnO	53.25
MgO	9.37
<u>H₂O</u>	<u>[8.42]</u>
Total	98.49

(1) Kombat mine, Otavi Valley, Namibia; average of 10 electron microprobe analyses, supplemented by Raman and FTIR spectroscopy, H₂O calculated from structure; corresponds to Mn²⁺_{33.55}Mg_{10.39}Fe²⁺_{0.14}Al_{0.68}As³⁺_{1.44}(Si_{6.67}P_{0.32}V⁵⁺_{0.37}As⁵⁺_{5.08})O₅₄(OH)₄₂.

Occurrence: In metamorphosed lenses associated with Cu-Pb-Ag sulfide ores in feldspathic sandstone that have been reworked by late hydrothermal solutions.

Association: Alleghanyite, chlorite, pyrochroite, “spinels”, ribbeite.

Distribution: From the E15-11 south stope, 11 level, at the 1241 m elevation, in the Asis West sector, Kombat mine, Otavi Valley, Namibia.

Name: Honors Colonel Eckhard D. Stuart (b. 1939) of Madison, Mississippi, USA., a mineral collector who has provided numerous samples for research, including this new species.

Type Material: Department of Natural History, Royal Ontario Museum, Toronto, Canada (M56375).

References: (1) Hawthorne, F.C., Y.A. Abdu, N.A. Ball, and W.W. Pinch (2013) Carlfrancisite: Mn²⁺₃(Mn²⁺, Mg, Fe³⁺, Al)₄₂(As³⁺O₃)₂(As⁵⁺O₄)₄[(Si, As⁵⁺)O₄]₆[(As⁵⁺, Si)O₄]₂(OH)₄₂, a new arseno-silicate mineral from the Kombat mine, Otavi Valley, Namibia. *Amer. Mineral.*, 98, 1693-1696.