Skorpionite $Ca_3Zn_2(PO_4)_2CO_3(OH)_2 \cdot H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As needle-like crystals, to 0.5 mm, elongated parallel to [001] with dominant {100} and {110}; additional forms {111}, {221}, {131}, {$\bar{1}$ 01}.

Physical Properties: *Cleavage*: None. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = 3.5 D(meas.) = 3.15(3) D(calc.) = 3.17

Optical Properties: Transparent. *Color*: Colorless. *Streak*: White.
Luster: Vitreous.
Optical Class: Biaxial (-). α = 1.5884(10) β =1.6445 (calc.) γ = 1.6455(10) 2V = 15.0(5)°
Orientation: $Y \wedge c = 26°$ (in acute β); $Z = b$.

Cell Data: *Space Group*: *C*2/*c*. a = 19.045(3) b = 9.320(2) c = 6.525(1) β = 92.73(2)° Z = 4

X-ray Powder Pattern: Skorpion mine, Lüderitz district, Karas region, south-western Namibia. Intensities corrected to remove effects of preferred orientation.
3.170 (100), 2.788 (67), 3.014 (54), 9.501 (53), 3.063 (42), 5.238 (30), 2.582 (21)

Chemistry:

	(1)	(2)
CaO	30.89	30.42
ZnO	28.83	29.43
P_2O_5	25.49	25.67
CO_2 (calc)	7.96	7.96
H_2O (calc)	6.52	6.52
Total	99.69	100.00

1) Skorpion mine, Lüderitz district, Karas region, south-western Namibia; average of 17 electron microprobe analyses, anionic groups confirmed by IR, H_2O and CO_2 calculated, corresponding to $Ca_{3.05}Zn_{1.96}(PO_4)_{1.99}(CO_3)_{1.00}(OH)_{2.06} \cdot 0.98H_2O$. (2) $Ca_3Zn_2(PO_4)_2CO_3(OH)_2 \cdot H_2O$.

Occurrence: A secondary mineral in an oxidized non-sulfide zinc deposit formed by weathering of sediment- and volcanic-hosted disseminated sulfide minerals.

Association: Tarbuttite, hydrozincite, gypsum.

Distribution: Skorpion zinc mine, Lüderitz district, Karas region, south-western Namibia.

Name: For the locality that produced the first specimens.

Type Material: Mineralogical Institute, University of Bochum, Germany, IMA 2005-010.

References: (1) Krause, W., H. Effenberger, H.-J. Bernhardt, and O. Medenbach (2008) Skorpionite, $Ca_3Zn_2(PO_4)_2CO_3(OH)_2 \cdot H_2O$, a new mineral from Namibia: description and crystal structure. Eur. J. Mineral., 20, 271–280. (2) (2009) Amer. Mineral., 94, 403 (abs. ref. 1).