Fahleite $\mathbf{Zn_5CaFe_2^{3+}(AsO_4)_6 \cdot 14H_2O}$

Crystal Data: Orthorhombic, probable. *Point Group:* n.d. Crystals are curved and twisted, in fibrous bundles, to about 1.5 cm; in minute spherical aggregates.

Physical Properties: *Cleavage:* One, perfect, ⊥ fiber length. *Tenacity:* Sectile, flexible. Hardness = Very soft. D(meas.) = n.d. D(calc.) = [3.08]

Optical Properties: Transparent. *Color:* Straw-yellow to gray, bright green; colorless in transmitted light. *Luster:* Silky or pearly.
Optical Class: Biaxial (+). *Orientation:* Z = length, parallel extinction, positive elongation.
$\alpha = 1.628(1)$ $\beta = 1.631(1)$ $\gamma = 1.656(1)$ 2V(meas.) = n.d. 2V(calc.) = 39°

Cell Data: *Space Group:* n.d. $a = 6.60$ $b = 11.6$ $c = 22.$ Z = 2

X-ray Powder Pattern: Tsumeb, Namibia; all lines very broad.
22. (10), 11. (10), 3.2 (8), 2.9 (5), 1.65 (2)

Chemistry:

	(1)	(2)
As_2O_5	43.6	44.08
Fe_2O_3	10.2	10.21
MnO	0.5	
ZnO	26.2	26.01
CaO	4.0	3.58
H_2O	15.5	16.12
Total	100.0	100.00

(1) Tsumeb, Namibia; by electron microprobe, average of five analyses; total Fe as Fe_2O_3, total Mn as MnO, H_2O by difference, confirmed by IR; corresponds to $Zn_{5.02}Ca_{1.11}Mn_{0.11}Fe_{1.99}(AsO_4)_{5.91} \cdot 13.42H_2O$. (2) $Zn_5CaFe_2(AsO_4)_6 \cdot 14H_2O$.

Occurrence: On oxidized tennantite–chalcocite ore from a deep oxidized zone of a dolostone-hosted hydrothermal polymetallic ore deposit.

Association: Lavendulan, cuprian adamite, conichalcite, tsumcorite, tennantite, chalcocite, quartz, calcite, gypsum.

Distribution: From Tsumeb, Namibia.

Name: In honor of Rolf Fahle (1943–), Munich, Germany, mineral dealer specializing in Tsumeb minerals, who supplied the specimen from which the species was described.

Type Material: Mineralogical Institute, Ruhr University, Bochum, Germany.

References: (1) Medenbach, O., K. Schmetzer, and K. Abraham (1988) Fahleite from Tsumeb/Namibia, a new mineral belonging to the smolianinovite group. Neues Jahrb. Mineral., Monatsh., 167–171. (2) (1989) Amer. Mineral., 74, 501–502 (abs. ref. 1).