Krieselite $Al_2GeO_4(F,OH)_2$

Crystal Data: Orthorhombic. *Point Group*: 2/*m* 2/*m* 2/*m*. As fibers to 50 μm in crusts, individual fibers are wedge-shaped aggregates of lamellae on {110}, and in hemispherical aggregates, to 200 μm.

Physical Properties: *Cleavage*: None. F*racture*: Irregular. *Tenacity*: Brittle.
D(meas.) = n.d. D(calc.) = 4.069 *Hardness* = 5.5-6.5

Optical Properties: Translucent. *Color*: Beige to white. *Streak*: White. *Luster*: Greasy.
Optical Class: n.d. *n*(calc.) = 1.74

Cell Data: *Space Group*: *Pbnm*. *a* = 4.809(2) *b* = 9.111(3) *c* = 8.536(3) Z = 4

X-ray Powder Pattern: Tsumeb mine, Tsumeb, Namibia.
3.016 (100), 3.811 (78), 3.315 (48), 2.247 (38), 1.398 (29), 2.417 (27), 2.464 (24)

Chemistry:

	(1)
GeO_2	38.32
SiO_2	0.33
Al_2O_3	44.34
Ga_2O_3	4.14
TiO_2	0.12
Fe_2O_3	0.43
CuO	0.05
ZnO	0.70
Sb_2O_3	0.33
As_2O_3	1.54
MgO	0.28
Na_2O	0.12
F	9.10
H_2O	[3.51]
-O=F	3.83
Total	99.48

(1) Tsumeb mine, Tsumeb, Namibia; average of 636 electron microprobe analyses supplemented by FTIR, PIXE and INAA, H_2O calculated and confirmed by spectroscopy; corresponding to $(Al_{1.860}Ga_{0.102}As^{3+}_{0.036}Zn_{0.020}Mg_{0.016}Fe^{3+}_{0.012}Na_{0.009}Sb^{3+}_{0.005}Ti_{0.003}Cu_{0.001})_{\Sigma=2.064}$ $(Ge_{0.844}Al_{0.143}Si_{0.013})_{\Sigma=1.000}O_4(F_{1.103}OH_{0.897})_{\Sigma=2.000}$.

Occurrence: From vugs in tennantite-chalcocite-galena-germanite ore in a complex polymetallic hydrothermal sulfide deposit.

Association: Quartz, wulfenite, anglesite, graphite (Tsumeb mine); schneiderhöhnite, stottite (Tsumeb mine 29th level).

Distribution: From the Tsumeb mine, Tsumeb, Otjikoto Region, Namibia.

Name: Honors Friedrich Wilhelm Kriesel who was the chief chemist at the Tsumeb mine laboratory around 1920.

Type Material: Mineralogical Museum, University of Hamburg, Germany.

References: (1) Schlüter, J., T. Geisler, D. Pohl, and T. Stephan (2010) Krieselite, $Al_2GeO_4(F,OH)_2$: A new mineral from the Tsumeb mine, Namibia, representing the Ge analogue of topaz. Neus Jb. Mineral. Abh., 187, 33-40. (2) (2011) Amer. Mineral., 96, 1656 (abs. ref. 1).