Ariegilatite $BaCa_{12}(SiO_4)_4(PO_4)_2OF_2$

Crystal Data: Hexagonal. *Point Group*: $\bar{3}$ 2/*m*. As flattened discoidal crystals to 0.5 mm. Pseudo-aciculate morphology is observed in thin sections.

Physical Properties: *Cleavage*: None. *Fracture*: Irregular. *Tenacity*: Brittle. Hardness = 4-4.5 VHN = 331-378, 356 average (50 g load). D(meas.) = n.d. D(calc.) = 3.329

Optical Properties: Transparent. *Color*: Colorless. S*treak*: White. *Luster*: Vitreous. *Optical Class*: Uniaxial (–). ω = 1.650(2) ε = 1.647(2) *Pleochroism*: None.

Cell Data: Space Group: $R\bar{3}m$. a = 7.1551(6) c = 41.303(3) Z = 3

X-ray Powder Pattern: Calculated pattern.
3.090 (100), 1.789 (92), 2.822 (82), 2.754 (62), 3.578 (51), 2.743 (51), 1.983 (47)

Chemistry:

	(1)		(1)
SO_3	0.17	CaO	53.84
V_2O_5	0.10	MgO	0.14
P_2O_5	9.83	K_2O	0.04
TiO_2	0.12	Na_2O	0.22
SiO_2	19.87	F	3.17
Al_2O_3	0.12	CO_2	[0.57]
BaO	12.26	$-O = F_2$	1.33
FeO	0.32	Total	99.72
MnO	0.29		

(1) Negev Desert, near Arad, Israel; average of 22 electron microprobe analyses supplemented by Raman spectroscopy, CO_2 calculated for charge balance; corresponds to $(Ba_{0.98}K_{0.01}Na_{0.01})_{\Sigma=1}(Ca_{11.77}Na_{0.08}Fe^{2+}_{0.06}Mn^{2+}_{0.05}Mg_{0.04})_{\Sigma=12}[(Si_{3.95}Al_{0.03}Ti_{0.02})_{\Sigma=4}O_{16}][(P_{1.70}C_{0.16}Si_{0.10}S^{6+}_{0.03}V_{0.01})_{\Sigma=2}O_8]F_{2.04}O_{0.96}$.

Group: Arctite group of the arctite supergroup.

Occurrence: In recrystallized zones of pyrometamorphic, fine-grained spurrite rocks, the high-temperature alteration products of minerals of an early clinker-like association.

Association: Spurrite, calcite, brownmillerite, shulamitite, CO_3-bearing fluorapatite, fluormayenite-fluorkyuygenite, periclase, brucite, barytocalcite, baryte, unidentified Ca-Fe- and Rb-bearing K-Fe sulfides, often overgrown and replaced by stracherite (Negev Desert, near Arad); gehlenite, spinel, fluormayenite, fluorapatite, perovskite (Daba-Siwaqa area); fluormayenite-fluorkyuygenite, brownmillerite, fluorapatite, gehlenite, jasmundite (Ma'ale Adummim).

Distribution: From the Negev Desert, near Arad, Israel; the northern part of the Daba-Siwaqa area, 80 km south of Amman, Jordan; and near Ma'ale Adummim, Palestineian Autonomy.

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Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4956/1).

References: (1) Galuskin, E.V., B. Krüger, I.O. Galuskina, H. Krüger, Y. Vapnik, J.A. Wojdyla, and M. Murashko (2018) New mineral with modular structure derived from hatrurite from the pyrometamorphic rocks of the Hatrurim Complex: Ariegilatite, $BaCa_{12}(SiO_4)_4(PO_4)_2F_2O$, from Negev Desert, Israel. Minerals, 8(3), 19. (2) (2020) Amer. Mineral., 105(8), 1275 (abs. ref. 1).