Bennesherite $Ba_2Fe^{2+}Si_2O_7$

Crystal Data: Tetragonal. *Point Group*: $\bar{4}$ 2*m*. As crystals to 80 μm; often epitaxial with fresnoite.

Physical Properties: *Cleavage*: Good on {001}. *Tenacity*: Brittle. *Fracture*: Conchoidal. Hardness = 5 VHN = 527-565, 540 average (25 g load). D(meas.) = n.d. D(calc.) = 4.27

Optical Properties: Transparent. *Color*: Light yellow to lemon-yellow. *Streak*: White. *Luster*: Vitreous.
Optical Class: Uniaxial (-). ω = 1.711(2) ε = 1.708(2)

Cell Data: *Space Group*: $P\bar{4}\,2_1m$. a = 8.2334(14) c = 5.2854(8) Z = 2

X-Ray Diffraction Pattern: Near Ben Nesher Mount, Hatrurim Basin, Negev Desert, Israel. 3.021 (100), 3.248 (39), 2.147 (22), 2.604 (21), 1.855 (18), 3.913 (15), 1.868 (15)

Chemistry:

	(1)
SiO_2	25.10
Fe_2O_3	[0.07]
Al_2O_3	0.55
BaO	55.23
SrO	0.93
ZnO	0.26
FeO	12.21
MnO	0.28
CaO	2.95
MgO	0.74
K_2O	0.16
Na_2O	0.17
Total	98.66

(1) Near Ben Nesher Mount, Hatrurim Basin, Negev Desert, Israel; average electron microprobe analysis supplemented by Raman spectroscopy, Fe_2O_3 calculated for charge balance; corresponds to $(Ba_{1.706}Ca_{0.249}Sr_{0.042}Na_{0.026}K_{0.016})_{\Sigma=2.040}(Fe^{2+}_{0.774}Mg_{0.087}Al_{0.051}Fe^{3+}_{0.035}Mn^{2+}_{0.019}Zn_{0.015})_{\Sigma=0.982}Si_{1.978}O_7$.

Mineral Group: Melilite group.

Occurrence: In intergranular spaces in thin veins of rankinite paralava within pyrometamorphic gehlenite hornfels.

Association: Rankinite, gehlenite, garnet, fresnoite, walstromite, zadovite, gurimite, hexacelsian, celsian.

Distribution: At Gurim Anticline, near Ben Nesher Mount, Hatrurim Basin, Negev Desert, Israel.

Name: For *Ben Nesher* Mount, near where the mineral was first collected.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (97004).

References: (1) Krzątała, A., B. Krüger, I. Galuskina, Y. Vapnik, and E. Galuskin (2022) Bennesherite, $Ba_2Fe^{2+}Si_2O_7$: A new melilite group mineral from the Hatrurim Basin, Negev Desert, Israel. Amer. Mineral., 107, 138-146. (2) Miyawaki, R., F. Hatert, M. Pasero, and S.J. Mills (2019) New minerals and nomenclature modifications approved in 2019. Mineral. Mag., 83(6), 887-893.