

Crystal Data: Monoclinic. *Point Group:* 2/m. As zones to ~ 1 mm² in prismatic crystals to 0.7 cm, intergrown with Hingganite-(Y).

Physical Properties: Cleavage: None. *Tenacity:* Brittle. *Fracture:* Conchoidal. Hardness = 5.5-6 VHN = 638-746, 685 average (100 g load). D(meas.) = n.d. D(calc.) = 4.690 Nonfluorescent.

Optical Properties: Transparent. *Color:* Dark greenish brown. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Biaxial (+). $\alpha = 1.746(5)$ $\beta = 1.766(5)$ $\gamma = 1.792(6)$ 2V(meas.) = 80(7) $^\circ$ 2V(calc.) = 84 $^\circ$ Non-pleochroic.

Cell Data: *Space Group:* P2₁/c. $a = 4.7719(1)$ $b = 7.6422(2)$ $c = 9.9299(2)$ $\beta = 89.851(2)^\circ$ Z = 2

X-ray Powder Pattern: Zagi Mt., near Kafoor Dheri, Khyber Pakhtunkhwa, Pakistan.
4.773 (100), 6.105 (95), 2.573 (89), 2.864 (87), 3.122 (68), 3.028 (61), 3.462 (58)

Chemistry:

	(1)		(1)
BeO	9.64	Gd ₂ O ₃	5.15
CaO	0.45	Tb ₂ O ₃	0.50
MnO	0.10	Dy ₂ O ₃	2.50
FeO	3.03	Ho ₂ O ₃	0.33
B ₂ O ₃	0.42	Er ₂ O ₃	0.84
Y ₂ O ₃	8.75	Tm ₂ O ₃	0.10
La ₂ O ₃	1.63	Yb ₂ O ₃	0.44
Ce ₂ O ₃	12.89	Lu ₂ O ₃	0.04
Pr ₂ O ₃	3.09	ThO ₂	0.13
Nd ₂ O ₃	16.90	SiO ₂	23.55
Sm ₂ O ₃	5.97	<u>H₂O</u>	<u>2.72</u>
Eu ₂ O ₃	1.08	Total	100.25

(1) Zagi Mt., near Kafoor Dheri, Khyber Pakhtunkhwa, Pakistan; average electron microprobe, IR and Raman spectroscopic analyses, BeO, B₂O₃, and Lu₂O₃ by LA-ICP-MS; H₂O calculated by stoichiometry; corresponds to (Nd_{0.513}Ce_{0.401}Y_{0.395}Sm_{0.175}Gd_{0.145}Pr_{0.096}Dy_{0.068}La_{0.051}Ca_{0.041}Eu_{0.031}Er_{0.022}Tb_{0.014}Yb_{0.011}Ho_{0.009}Tm_{0.003}Th_{0.003}Lu_{0.001}) _{$\Sigma=1.979$} (□_{0.778}Fe²⁺_{0.215}Mn_{0.007}) _{$\Sigma=1.000$} (Be_{1.967}B_{0.062}) _{$\Sigma=2.029$} Si₂O_{8.46}(OH)_{1.54}. (2) Nd₂□Be₂Si₂O₈(OH)₂ requires BeO 9.54, Nd₂O₃ 64.13, SiO₂ 22.90, and H₂O 3.43, Total 100.

Mineral Group: Gadolinite supergroup, gadolinite group.

Occurrence: In weathered alluvium from gneissic alkaline A-type granite.

Association: Hingganite-(Y), aegirine, microcline, fergusonite-(Y), zircon.

Distribution: From Zagi Mountain, near Kafoor Dheri, ~4 km south of Warsak and 30 km northwest of Peshawar, Khyber Pakhtunkhwa Province, Pakistan.

Name: The suffix indicates an analogue of *hingganite*-(Y), *hingganite*-(Yb), and *hingganite*-(Ce), but with Nd dominant among the rare earth elements.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (5370/1; 96591).

References: (1) Kasatkin, A.V., F. Nestola, R. Škoda, N.V. Chukanov, A.A. Agakhanov, D.I. Belakovskiy, A. Lanza, M. Holá, and M.S. Rumsey (2020) Hingganite-(Nd), Nd₂□Be₂Si₂O₈(OH)₂, a new gadolinite-supergroup mineral from Zagi Mountain, Pakistan. Can. Mineral., 58, 549-562.