

Fergusonite-beta-(Nd)**(Nd, Ce)NbO₄**

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Crystal Data: Monoclinic, metamict. *Point Group:* n.d. As prismatic dipyramidal crystals, to 0.25 mm, also as irregular grains.

Physical Properties: *Fracture:* Subconchoidal. *Tenacity:* Brittle. Hardness = [5.5–6.5] [by analogy to fergusonite-(Y)]. D(meas.) = n.d. D(calc.) = n.d.

Optical Properties: Semitransparent. *Color:* Brownish red, red, yellowish brown, or yellowish red. *Streak:* Pale brown. *Luster:* Vitreous to greasy. *Optical Class:* Isotropic to weakly anisotropic. $n = 2.0$

Cell Data: *Space Group:* n.d. $a = 5.07$ $b = 5.62$ $c = 5.41$ $\beta = 93.0^\circ$ $Z = [2]$

X-ray Powder Pattern: Bayan Obo, China; untreated material. 3.2064 (10), 3.0253 (10), 1.8832 (9), 2.7976 (5), 2.6961 (5), 2.0648 (5), 1.9549 (5)

| Chemistry: | (1) | | (1) |
|------------|--------------------------------|-------|--------------------------------------|
| | Nb ₂ O ₅ | 41.00 | Al ₂ O ₃ 0.12 |
| | Ta ₂ O ₅ | 0.11 | RE ₂ O ₃ 55.00 |
| | SiO ₂ | 0.29 | FeO 0.27 |
| | TiO ₂ | 0.17 | MnO 0.30 |
| | ThO ₂ | 1.09 | MgO 0.07 |
| | ZrO ₂ | 0.19 | CaO 0.29 |
| | UO ₂ | 1.46 | <hr/> Total 100.36 |

(1) Bayan Obo, China; RE₂O₃ = La₂O₃ 2.05%, Ce₂O₃ 14.62%, Pr₂O₃ 4.28%, Nd₂O₃ 21.25%, Sm₂O₃ 4.53%, Eu₂O₃ 0.21%, Gd₂O₃ 1.37%, Tb₂O₃ 0.71%, Dy₂O₃ 0.98%, Ho₂O₃ 0.56%, Er₂O₃ 0.51%, Tm₂O₃ 0.36%, Yb₂O₃ 0.45%, Lu₂O₃ 0.29%, Y₂O₃ 2.83%; corresponds to (Nd_{0.38}Ce_{0.27}Pr_{0.08}Sm_{0.08}Y_{0.08}La_{0.04}Gd_{0.02}Dy_{0.02}Tb_{0.01}Ho_{0.01}Er_{0.01}Tm_{0.01}Yb_{0.01})_{Σ=1.02}(U, Th, Ca, Fe)_{Σ=0.06}(Nb, Ta, Ti)_{Σ=0.96}O₄.

Polymorphism & Series: Dimorphous with fergusonite-(Nd).

Occurrence: In sodium-metasomatised carbonatite-derived dolomitic marble.

Association: Riebeckite, ferroan dolomite, biotite, magnetite, monazite, bastnäsite, aeschynite-(Nd), ilmenite, pyrite, fergusonite-(Ce), fergusonite-(Nd).

Distribution: From the Bayan Obo Fe–Nb–RE deposit, 130 km north of Baotou, Inner Mongolia, China.

Name: In allusion to its dimorphous relation to *fergusonite*-(Nd).

Type Material: n.d.

References: (1) Sun Weijun, Ma Fengjun, and Zhuang Shijie (1983) Fergusonite-beta-Nd. *Scientia Geologica Sinica*, 78–81 (in Chinese with English abs.). (2) (1984) *Amer. Mineral.*, 69, 406–407 (abs. ref. 1).