

Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals are short prismatic or thick tabular on (001) to 1.5 cm. *Twinning:* Sometimes observed.

Physical Properties: *Cleavage:* None observed. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = ~5.9 VHN = 606-717, 650 average (25 g load). D(meas.) = 4.83(7) D(calc.) = 4.88 Non-fluorescent.

Optical Properties: Translucent to opaque. *Color:* Black, brown-black in thin fragments; grayish yellow in reflected light with weak anisotropy and birefractance. *Streak:* Brown.

Luster: Submetallic-metallic.

Optical Class: Biaxial (-). $\alpha = 1.978(5)$ $\beta = \text{n.d.}$ $\gamma = 2.010(5)$ $2V \approx 60^\circ$ *Pleochroism:* Strong, $X = \text{yellowish or brownish}$, $Z = \text{brown black}$. *Dispersion:* $r > v$. *Orientation:* $Y = b$, $c \wedge r \approx 4^\circ$. R_1 - R_2 : (400) 10.1-10.4, (420) 10.4-10.9, (440) 10.7-10.8, (460) 10.7-11.0, (470) 11.0-11.8, (480) 11.2-11.8, (500) 11.4-11.8, (560) 11.6-12.1, (580) 11.6-11.9, (589) 11.4-12.5, (600) 11.0-11.8, (620) 10.6-11.7, (640) 10.6-11.6, (650) 10.6-11.8

Cell Data: *Space Group:* $P2_1/a$ (pseudo $C2/m$). $a = 13.4656(15)$ $b = 5.7356(6)$ $c = 11.0977(12)$ $\beta = 100.636(2)^\circ$ $Z = 2$

X-ray Powder Pattern: Bayan Obo REE-Nb-Fe Mine, near Baotou city, North China. 2.7524 (100), 2.7263 (98), 3.1978 (68), 2.5460 (54), 2.8702 (52), 3.1622 (46), 4.6154 (39)

Chemistry:	(1)		(1)
SiO ₂	19.29	MgO	1.32
TiO ₂	18.26	CaO	2.17
Al ₂ O ₃	0.04	Nb ₂ O ₅	0.47
FeO	8.49	La ₂ O ₃	19.53
Fe ₂ O ₃	1.67	Ce ₂ O ₃	28.08
ThO ₂	0.16	Total	99.48

(1) Bayan Obo REE-Nb-Fe Mine, near Baotou city, North China; electron microprobe analysis supplemented by Mössbauer spectroscopy for Fe³⁺/Fe²⁺ ratio; corresponding to (Ce_{2.13}La_{1.49}Ca_{0.48}Th_{0.01}) $\Sigma=4.11$ Fe²⁺(Ti_{0.88}Fe²⁺_{0.47}Mg_{0.41}Fe³⁺_{0.26}Al_{0.01}) $\Sigma=2.03$ (Ti_{1.96}Nb_{0.04}) $\Sigma=2.00$ (Si₂O₇)₂O₈.

Polymorphism & Series: Polymorph of perrierite-(Ce).

Mineral Group: Chevkinite supergroup, chevkinite group.

Occurrence: In magnesian skarn in the excontact of granite within dolomitic marble.

Association: Diopside, tremolite, richterite, F-rich phlogopite, humite, chlinohumite, chondrodite, allanite-(Ce), magnetite, ilmenite, spinel, titanite, pyrochlore, fluorapatite, fluorellestadite(?), calcite, dolomite, pyrite, quartz, fluorite, zircon.

Distribution: Bayan Obo REE-Nb-Fe mine, near Baotou city, Inner Mongolian Autonomous Region, North China.

Name: Honors *Ding Daoheng* (1899-1955), who discovered the world-famous Bayan Obo REE-Nb-Fe ore deposit in 1927 and a suffix indicates that Ce is the dominant rare-earth element.

Type Material: Geological Museum of China, Beijing, China.

References: (1) Xu, J., G. Yang, G. Li, Z. Wu, and G. Shen (2008) Dingdaohengite-(Ce) from the Bayan Obo REE-Nb-Fe Mine, China: Both a true polymorph of perrierite-(Ce) and a titanic analog at the C1 site of chevkinite subgroup. *Amer. Mineral.*, 93, 740-744.