

Fluorcalciopyrochlore**(Ca, Na)₂Nb₂O₆F**

Crystal Data: Cubic. *Point group:* $4/m\bar{3}2/m$. As disseminated euhedral or subhedral grains to 0.3 mm that display {111}, {110}, and {100}.

Physical Properties: *Cleavage:* None. *Tenacity:* Brittle. *Fracture:* Conchoidal. Hardness = 5 VHN = 424. D(meas.) = n.d. D(calc.) = 4.34

Optical Properties: Transparent to translucent. *Color:* Brownish yellow to reddish orange, brown in transmitted light; gray in reflected light. *Streak:* Light yellow. *Luster:* Adamantine to greasy. *Optical Class:* Isotropic. $n > 1.9$ $n(\text{calc.}) = 2.06$

R: (400) 18.73, (420) 18.83, (440) 18.93, (460) 19.04, (470) 19.09, (480) 19.15, (500) 19.25, (520) 19.35, (540) 19.46, (546) 19.49, (560) 19.56, (580) 19.67, (589) 19.71, (600) 19.77, (620) 19.87, (640) 19.98, (650) 20.03, (660) 20.08, (680) 20.19, (700) 20.29

Cell Data: *Space Group:* $Fd\bar{3}m$. $a = 10.4164(9)$ $Z = 8$

X-ray Powder Pattern: Bayan Obo REE deposit, Inner Mongolia, People's Republic of China. 3.017 (100), 1.843 (29), 2.613 (17), 1.571 (15), 6.040 (9), 1.503 (2), 1.302 (2)

Chemistry:	(1)		(1)
Na ₂ O	6.30	TiO ₂	6.31
CaO	17.59	UO ₂	0.26
FeO	0.10	Nb ₂ O ₅	61.36
SrO	0.85	F	4.76
PbO	0.24	ThO ₂	0.76
Ce ₂ O ₃	2.51	ZrO ₂	0.51
La ₂ O ₃	0.50	SnO ₂	0.30
Nd ₂ O ₃	0.57	<u>-O = F₂</u>	<u>2.00</u>
Y ₂ O ₃	0.42	Total	101.44

(1) Bayan Obo REE deposit, Inner Mongolia, People's Republic of China; average of 10 electron microprobe analyses supplemented by IR spectroscopy; corresponds to $(\text{Ca}_{1.14}\text{Na}_{0.74}\text{Ce}_{0.06}\text{Sr}_{0.03}\text{Th}_{0.01}\text{Fe}_{0.01}\text{Y}_{0.01}\text{La}_{0.01}\text{Nd}_{0.01})_{\Sigma=2.02}(\text{Nb}_{1.68}\text{Ti}_{0.29}\text{Zr}_{0.02}\text{Sn}_{0.01})_{\Sigma=2.00}\text{O}_{6.00}(\text{F}_{0.92}\text{O}_{0.08})_{\Sigma=1.00}$.

Mineral Group: Pyrochlore supergroup (general formula - $A_2B_2X_6Y$); pyrochlore group ($B = \text{Nb}^{5+}$).

Occurrence: In the dolomitic carbonatite.

Association: Dolomite, calcite, aegirine, riebeckite, diopside, fluorite, barite, phlogopite, rutile, britholite-(Ce), bastnäsite-(Ce), zircon, magnetite, pyrite, fersmite, columbite-(Fe), monazite-(Ce).

Distribution: From the Bayan Obo REE-niobium deposit, Inner Mongolia, People's Republic of China.

Name: For a member of the *pyrochlore* group with prefixes to indicate dominant fluorine (*fluor*) in the Y site and dominant calcium (*calcio*) in the A site.

Type Material: Geological Museum of China, Beijing, People's Republic of China (M12182).

References: (1) Guowu, L., Y. Guangming, L. Fude, X. Ming, G. Xiangkun, P. Baoming, and J. de Fourestier (2016) Fluorcalciopyrochlore, a new mineral species from Bayan Obo, Inner Mongolia, P.R. China. *Can. Mineral.*, 54(5), 1285-1291. (2) (2018) *Amer. Mineral.*, 103, 2045-2046 (abs. ref. 1). (3) Atencio, D., M.B. Andrade, A.G. Christy, R. Gieré, and P.M. Kartashov (2010) The pyrochlore supergroup of minerals: nomenclature. *Can. Mineral.*, 48, 673-698.