

Oxynatromicrolite**(Na, Ca, U)₂Ta₂O₆(O, F)**

Crystal Data: Cubic. *Point group:* $4/m\bar{3}2/m$. Crystals are octahedra, rhombic dodecahedra, cubes, or their combinations, to 0.20 mm.

Physical Properties: *Cleavage:* None. *Tenacity:* Brittle. *Fracture:* Conchoidal. Hardness = ~ 5 VHN = 374.5-562.9, 466.3 average (100 g load). D(meas.) = 6.580(4) D(calc.) = 6.506 Metamict.

Optical Properties: Opaque (translucent on thin edges). *Color:* Brown or yellowish brown. *Streak:* Yellowish brown. *Luster:* Greasy to waxy.

Optical Class: Isotropic (recrystallized). $n(\text{meas.}) = 1.999(5)$

R: (400) 11.36, (420) 12.18, (440) 12.18, (460) 11.98, (470) 11.88, (480) 11.80, (500) 11.65, (520) 11.52, (540) 11.42, (546) 11.42, (560) 11.36, (580) 11.10, (589) 11.05, (600) 11.00, (620) 10.92, (640) 10.74, (650) 10.69, (660) 10.67, (680) 10.54, (700) 10.38

Cell Data: *Space Group:* $Fd\bar{3}m$. $a = 10.420(6)$ $Z = 8$

X-ray Powder Pattern: Guanpo, Lushi county, Henan Province, China. (Heated and recrystallized) 3.0257 (100), 6.1489 (40), 1.8441 (35), 1.5705 (30), 2.6165 (25), 1.1960 (15), 2.0089 (10)

Chemistry:	(1)		(1)
Na ₂ O	5.41	Sb ₂ O ₅	0.23
CaO	4.56	TiO ₂	0.05
UO ₂	14.60	SiO ₂	0.56
La ₂ O ₃	0.16	SnO ₂	0.29
Ce ₂ O ₃	0.11	F	1.04
Nd ₂ O ₃	0.13	H ₂ O	[1.50]
PbO	0.62	<u>-O = F₂</u>	<u>0.44</u>
Ta ₂ O ₅	61.52	Total	98.53
Nb ₂ O ₅	8.21		

(1) Guanpo, Lushi county, Henan Province, China; average of 18 electron microprobe analyses supplemented by IR spectroscopy and DTA, H₂O calculated from stoichiometry; corresponds to [Na_{0.99}Ca_{0.46}U_{0.31}Pb_{0.02}La_{0.01}(H₂O)_{0.21}]_{Σ=2.00}(Ta_{1.58}Nb_{0.35}Si_{0.05}Sn_{0.01}Sb_{0.01})_{Σ=2.00}O₆[O_{0.43}F_{0.31}(H₂O)_{0.26}]_{Σ=1.00}.

Mineral Group: Pyrochlore supergroup (general formula - A₂B₂X₆Y); microlite group (B = Ta⁵⁺).

Occurrence: In a rare-element granitic pegmatite, crystallized from a highly evolved felsic magma or transitional magmatic-hydrothermal fluids enriched in volatile, flux and lithophile elements.

Association: Quartz, albite, potassium feldspar, muscovite, kaolinite, tantalite-Mn, stibiotantalite, pollucite, spodumene, montebrasite, Hf-rich zircon, tourmaline, polyolithionite, trilithionite, luanshiweite-2M₁.

Distribution: From the No. 309 rare-element granitic pegmatite vein, Guanpo, Lushi county, Henan Province, China.

Name: For a member of the *microlite* group with prefixes to indicate essential oxygen (*oxy*) in the Y site and dominant sodium (*natro*) in the A site.

Type Material: Geological Museum of China, Beijing, China (M11940).

References: (1) Guang, F., G. Xiangkun, L. Guowu, Yu. Apeng, and S. Ganfu (2017) Oxynatromicrolite, (Na,Ca,U)₂Ta₂O₆(O,F), a new member of the pyrochlore supergroup from Guanpo, Henan Province, China. *Mineral. Mag.*, 81(4), 743-751. (2) (2018) *Amer. Mineral.*, 103, 2048 (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.