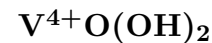


Duttonite



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Crystal Data: Monoclinic; pseudo-orthorhombic. *Point Group:* $2/m$. In crusts and masses of six-sided, platy, pseudo-orthorhombic crystals, to 1 mm, flattened || {001}, with {100} and {110}.

Physical Properties: *Cleavage:* {001}, good to perfect. Hardness = ~ 2.5 D(meas.) = n.d. D(calc.) = 3.24

Optical Properties: Transparent. *Color:* Pale brown, becoming greenish with alteration. *Luster:* Vitreous.

Optical Class: Biaxial (+). *Pleochroism:* X = pale pinkish brown; Y = pale yellow-brown; Z = pale brown. *Orientation:* X = a; Y = c; Z = b. *Dispersion:* $r < v$, moderate. $\alpha = 1.810(3)$
 $\beta = 1.900(3)$ $\gamma = > 2.01$ $2V(\text{meas.}) = \sim 60^\circ$

Cell Data: *Space Group:* $I2/c$. $a = 8.80(2)$ $b = 3.95(1)$ $c = 5.96(2)$ $\beta = 90^\circ 40(5)'$
Z = 4

X-ray Powder Pattern: Peanut mine, Colorado, USA.

4.40 (100), 3.61 (85), 1.838 (21), 2.480 (15), 2.454 (15), 1.974 (14), 3.29 (13)

Chemistry:

	(1)	(2)
V ₂ O ₄	78.1	82.16
V ₂ O ₃	2.7	
FeO	0.4	
H ₂ O	18.8	17.84
Total	[100.0]	100.00

(1) Peanut mine, Colorado, USA; by spectrophotometry, H₂O by CHN analyzer; recalculated to 100% after deduction of 4.2% insoluble selenium and quartz. (2) VO(OH)₂.

Occurrence: A secondary mineral formed by the low-temperature hydrothermal alteration of vanadium-bearing minerals.

Association: Melanovanadite, lenoblite, selenium, simplotite, montroseite, paramontroseite, uraninite, coffinite (Peanut mine, Colorado, USA); hewettite, ferverite, schoderite, metaschoderite, strazekite (Wilson Springs, Arkansas, USA).

Distribution: In the USA, found at the Peanut mine, Bull Canyon area, Uravan district, Montrose Co., and at the Sundown claim, Gypsum Valley, Slick Rock district, San Miguel Co., Colorado; in the Wilson Springs (Potash Sulphur Springs) mine, Garland Co., Arkansas. From the Urcal deposit, La Rioja, Argentina. At the Mounana uranium mine, Franceville, Gabon.

Name: Honors Captain Clarence Edward Dutton (1841–1912), American geologist with the U.S. Geological Survey, an early worker on the Colorado Plateau.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 134144.

References: (1) Thompson, M.E., C.H. Roach, and R. Meyrowitz (1956) Duttonite, new vanadium mineral from Peanut mine, Montrose County, Colorado. *Science*, 123, 990. (2) (1956) *Amer. Mineral.*, 41, 958 (abs. ref. 1). (3) Thompson, M.E., C.H. Roach, and R. Meyrowitz (1957) Duttonite, a new quadrivalent vanadium oxide from the Peanut mine, Montrose County, Colorado. *Amer. Mineral.*, 42, 455–460. (4) Evans, H.T., Jr. and M.E. Mrose (1958) The crystal structures of three new vanadium oxide minerals. *Acta Cryst.*, 11, 56–58.