Crystal Data: Triclinic. *Point Group*: 1. As needles with wedge-shaped terminations to 1 mm.

**Physical Properties**: *Cleavage*:  $\{001\}$  perfect,  $\{100\}$  and  $\{010\}$  very good. *Tenacity*: Brittle. *Fracture*: Splintery. Hardness = 3 D(meas.) = 2.97(2) D(calc.) = 2.982

**Optical Properties**: Transparent. *Color*: Yellow. *Streak*: Orange. *Luster*: Subadamantine. *Optical Class*: Biaxial (+).  $\alpha > 1.95 \ \beta > 1.95 \ \gamma > 1.95 \ 2V(meas.) = 72(2)^{\circ}$ *Dispersion*: Moderate, r > v. *Orientation*:  $X \land b = 7^{\circ}, Z \approx c$ . *Pleochroism*: X = brown-orange, Y = orange-yellow, Z = yellow. *Absorption*: X >> Y > Z.

**Cell Data**: Space Group:  $P\overline{1}$ . a = 7.3452(4) b = 9.9291(4) c = 10.0151(7)  $\alpha = 94.455(7)^{\circ}$  $\beta = 98.476(7)^{\circ}$   $\gamma = 100.779(7)^{\circ}$  Z = 2 (table 3, Z = 4)

**X-Ray Diffraction Pattern**: Wilson Springs vanadium mine, Wilson Springs, Arkansas, USA. 9.88 (100), 3.283 (44), 2.973 (26), 7.12 (24), 3.202 (22), 3.671 (20), 3.110 (19)

Chemistry:		(1)	(2)
	CaO	8.41	8.85
	$Fe_2O_3$	24.69	25.20
	$Mn_2O_3$	0.10	
	$P_2O_5$	0.11	
	$V_2O_5$	59.52	57.41
	<u>H</u> <sub>2</sub> O	[8.70]	8.53
	Total	101.53	100.00

(1) Wilson Springs vanadium mine, Wilson Springs, Arkansas, USA; average electron microprobe analysis, H<sub>2</sub>O calculated; corresponds to  $Ca_{0.93}Fe^{3+}_{1.92}Mn^{3+}_{0.01}V_{4.06}P_{0.01}O_{17}H_{6.00}$ . (2)  $Ca(H_2O)_3Fe^{3+}_2(V_2O_7)_2$ .

**Occurrence**: A secondary mineral found in brown concretionary masses in potassic fenitized, feldspathoidal syenite.

Association: Mikehowardite, bokite, and an indistinct smectite-group mineral.

**Distribution**: From the North Wilson pit, Wilson Springs mine (also known as Union Carbide mine), Wilson Springs (also known as Potash Sulfur Springs), Garland Co., Arkansas, USA.

**Name**: Honors American geologist and mineralogist *Don* R. *Owens* (1937-2015). Owens had a distinguished career in vanadium exploration with Union Carbide, retired in 1983 and became an independent consultant and a faculty member in the Department of Earth Sciences, University of Arkansas, at Little Rock.

**Type Material**: Natural History Museum of Los Angeles County, Los Angeles, California, USA (75041).

**References:** (1) Kampf, A.R., J.M. Hughes, B.P. Nash, and J.B. Smith (2022) Donowensite,  $Ca(H_2O)_3Fe^{3+}_2(V_2O_7)_2$ , and mikehowardite,  $Fe^{3+}_4(VO_4)_4(H_2O)_2 \cdot H_2O$ , two new vanadium minerals from the Wilson Springs vanadium mine, Wilson Springs, Arkansas, USA. Can. Mineral., 60, 543-554.