Nashite $Na_3Ca_2[(V^{4+}V^{5+}_9)O_{28}]\cdot 24H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. Crystals equant to tabular on {010}, to 0.3 mm, typically stacked in parallel intergrowths. Crystals display {010}, {110}, {011}, {11$\bar{1}$ }, {10$\bar{1}$ }.

Physical Properties: *Cleavage*: Good on {010}. *Fracture*: Irregular. *Tenacity*: Brittle. *Hardness* = ~ 2 D(meas.) = n.d. D(calc.) = 2.350

Optical Properties: Transparent. *Color*: Bluish green. *Streak*: Pale bluish green. *Luster*: Subadamantine.
Optical Class: Biaxial (–). α = 1.737(3) β = 1.762(6) γ = 1.775(3) 2V(meas.) = 70(2)° 2V(calc.) = 71° *Orientation*: $Y = b$, $X \approx a$. *Dispersion*: Probably strong based on "anomalous polarization colors. *Pleochroism*: X = greenish blue, Y = yellowish green, Z = yellow. *Absorption*: $X > Y >> Z$.

Cell Data: *Space Group*: $P2_1/n$. a = 10.0099(3) b = 21.8472(7) c = 11.1504(7) β = 116.584(8)° Z = 2

X-ray Powder Pattern: Little Eva mine, Yellow Cat District, Grand County, Utah, USA. 9.044 (100), 8.350 (64), 10.995 (46), 2.9942 (29), 5.526 (17), 6.962 (15), 3.5014 (15)

Chemistry:

	(1)	(2)
Na_2O	6.99	6.04
K_2O	0.02	
CaO	8.19	7.29
SrO	0.29	
VO_2	[6.11]	5.39
V_2O_5	[60.28]	53.19
H_2O	[18.12]	28.10
Total	100.00	100.00

(1) Little Eva mine, Yellow Cat District, Grand County, Utah, USA.; average of 32 electron microprobe analyses, VO_2, V_2O_5, H_2O calculated from structure analysis; corresponding to $(Na_{3.063}K_{0.007})_{\Sigma=3.070}(Ca_{1.984}Sr_{0.039})_{\Sigma=2.019}[(V^{4+}V^{5+}_9)O_{28}]\cdot 24(H_{1.995}O)$.
(2) $Na_3Ca_2[(V^{4+}V^{5+}_9)O_{28}]\cdot 24H_2O$.

Occurrence: As efflorescences on sandstone in the underground workings of a roll-front type uranium vanadium deposit, from the oxidation of montroseite-corvusite assemblages in a moist environment, possibly controlled by the presence of organic matter and phases such as pyrite.

Association: Calciodelrioite, calcite, gypsum, huemulite, pascoite, rossite, sherwoodite.

Distribution: From the Little Eva mine, Yellow Cat District, Grand County, Utah, and the St. Jude mine, Slick Rock district, San Miguel County, Colorado, USA.

Name: Honors Dr. Barbara P. Nash (b. 1944), Professor of Geology and Geophysics, University of Utah, Salt Lake City, Utah, USA., for her many contributions to the geochemistry and petrogenesis of volcanic systems, as well as, for her contributions to the description of several new minerals.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA. (#63583, 63584, 63585, 63586, 63587).

References: (1) Kampf, A.R., J.M. Hughes, J. Marty, and F.H. Brown (2013) Nashite, $Na_3Ca_2[(V^{4+}V^{5+}_9)O_{28}]\cdot 24H_2O$, a new mineral species from the Yellow Cat Mining District, Utah and the Slick Rock Mining District, Colorado: Crystal structure and descriptive mineralogy. Can. Mineral., 51(1), 27-37. (2) (2015) Amer. Mineral., 100, 1328-1329 (abs. ref. 1).