

**Crystal Data:** Monoclinic. *Point Group:* 2/m. As tapering prismatic to bladed crystals, to ~0.2 mm, elongated along [20 $\bar{1}$ ]; in radial aggregates of intergrown, thin to thick, diamond-shaped tablets, flattened on {102}, to 0.5 mm.

**Physical Properties:** *Cleavage:* Perfect on {010} and {101}. *Fracture:* Splintery. *Tenacity:* Brittle. *Hardness* = ~ 2.5 *D(meas.)* = n.d. *D(calc.)* = 4.112 Slowly soluble in dilute HCl.

**Optical Properties:** Transparent. *Color:* Reddish brown; light reddish brown in transmitted light. *Streak:* Pale tan. *Luster:* Vitreous. *Optical Class:* Biaxial (+).  $\alpha = 1.712(3)$   $\beta = 1.725(3)$   $\gamma = 1.756(3)$   $2V(\text{meas.}) = 65.6(4)^\circ$  *Orientation:*  $Z = b$ ;  $X \wedge a = 18^\circ$  in obtuse  $\beta$ . *Dispersion:* Slight,  $r < v$ . *Pleochroism:* Imperceptible.

**Cell Data:** *Space Group:* C2/c.  $a = 12.3282(4)$   $b = 12.6039(5)$   $c = 6.8814(5)$   $\beta = 113.480(8)^\circ$   $Z = 4$

**X-ray Powder Pattern:** Torrecillas mine, Salar Grande, Iquique Province, Chile. 2.740 (100), 3.296 (57), 2.819 (42), 6.33 (34), 1.5364 (31), 3.608 (29), 3.150 (28)

Chemistry:	(1)	(2)	(3)
Na <sub>2</sub> O	3.82	5.54	5.11
CaO	0.52	0.04	
MgO	2.91	2.31	
MnO	27.88	31.80	35.08
CoO	2.52	0.43	
CuO	1.40	1.88	
As <sub>2</sub> O <sub>5</sub>	60.27	58.45	56.84
H <sub>2</sub> O	[3.59]	[2.48]	2.97
Total	102.91	102.93	100.00

(1) Torrecillas mine, Salar Grande, Iquique Province, Chile; average of 5 electron microprobe analyses, H<sub>2</sub>O calculated for charge balance; corresponding to Na<sub>0.71</sub>Ca<sub>0.05</sub>Mn<sub>2.25</sub>Mg<sub>0.41</sub>Co<sub>0.19</sub>Cu<sub>0.10</sub>Σ=3.71As<sub>3</sub>O<sub>12</sub>H<sub>2.28</sub>. (2) Torrecillas mine, Salar Grande, Iquique Province, Chile; average of 25 electron microprobe analyses, H<sub>2</sub>O calculated for charge balance; corresponding to (Na<sub>1.05</sub>Mn<sub>2.64</sub>Mg<sub>0.34</sub>Co<sub>0.03</sub>Cu<sub>0.14</sub>)Σ=4.20As<sub>3</sub>O<sub>12</sub>H<sub>1.62</sub>. (3) NaMn<sub>3</sub>[AsO<sub>4</sub>][AsO<sub>3</sub>(OH)]<sub>2</sub>.

**Occurrence:** A secondary mineral from the oxidation of native arsenic and other As-bearing primary phases, followed by later alteration by saline fluids derived from evaporating meteoric water under hyperarid conditions.

**Association:** Anhydrite, halite, lavendulan, magnesiokoritnigite, pyrite, quartz, scorodite.

**Distribution:** From three separate sites at the Torrecillas mine, Salar Grande, Iquique Province, Chile.

**Name:** Honors Claudio Canut de Bon Urrutia (b. 1937), Chilean mining engineer and Senior Professor of Geology and Mineralogy, La Serena University, Coquimbo Region, Chile.

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA (64065, 64098).

**References:** (1) Kampf, A.R., S.J. Mills, F. Hatert, B.P. Nash, M. Dini, and A.A. Molina Donoso (2014) Canutite, NaMn<sub>3</sub>[AsO<sub>4</sub>][AsO<sub>3</sub>(OH)]<sub>2</sub>, a new protonated alluaudite-group mineral from the Torrecillas mine, Iquique Province, Chile. *Mineral. Mag.*, 78(4), 787-795. (2) (2016) Amer. Mineral., 101, 1242 (abs. ref. 1).