Walthierite $Ba_{0.5}Al_3(SO_4)_2(OH)_6$

Crystal Data: Hexagonal. *Point Group:* $\overline{3}\ 2/m$ or $3m$. As tabular subhedral to anhedral crystals, to 100 μm, in granular aggregates.

Physical Properties: *Cleavage:* On {001}, perfect. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.02

Optical Properties: Transparent. *Color:* White to pale yellow. *Streak:* White. *Luster:* Vitreous.
Optical Class: Uniaxial (+). $\omega = 1.588(2)$ $\epsilon = 1.604(2)$

Cell Data: *Space Group:* [$R\overline{3}m$ or $R3m$] (by analogy to alunite). $a = 6.992(4)$ $c = 34.443(8)$ $Z = 6$

X-ray Powder Pattern: Reina vein, Chile.
2.98 (100), 2.283 (80), 1.909 (70), 1.747 (60), 3.49 (55), 5.73 (50), 4.97 (45)

Chemistry:

	(1)
SO_3	34.59
P_2O_5	0.03
Al_2O_3	33.65
Fe_2O_3	0.05
CaO	0.07
SrO	0.04
BaO	16.17
Na_2O	0.28
K_2O	0.42
F	0.03
H_2O	[11.89]
$-O = F_2$	0.01
Total	[98.21]

(1) Reina vein, Chile; by electron microprobe, average of six analyses, H_2O calculated for stoichiometry; corresponds to $(Ba_{0.48}Na_{0.04}K_{0.04}Ca_{0.01})_{\Sigma=0.57}Al_{3.00}(S_{1.96}O_{3.96})_2[(OH)_{5.99}F_{0.01}]_{\Sigma=6.00}$.

Mineral Group: Alunite group.

Occurrence: Rare, in open-space filling of a fault, formed by reaction of hydrothermal fluids with barite.

Association: Alunite, barite, jarosite, pyrite, quartz.

Distribution: From the Reina vein, about seven km southeast of the El Indio mine, El Indio-Tambo district, east of La Serena, Coquimbo, Chile.

Name: To honor Dr. Thomas Nash Walthier (1923–1990), American economic geologist, St. Joseph Minerals Co., who worked in the Tambo district, Chile.

Type Material: National Museum of Natural History, Washington, D.C., USA, 170208, 170209.

References: (1) Li, G., D.R. Peacor, E.J. Essene, D.R. Brosnahan, and R.E. Beane (1992) Walthierite, $Ba_{0.5}\square_{0.5}Al_3(SO_4)_2(OH)_6$, and huangite, $Ca_{0.5}\square_{0.5}Al_3(SO_4)_2(OH)_6$, two new minerals of the alunite group from the Coquimbo region, Chile. Amer. Mineral., 77, 1275–1284.