## Wayneburnhamite $Pb_9Ca_6(Si_2O_7)_3(SiO_4)_3$

**Crystal Data**: Hexagonal. *Point Group*: $\bar{6}$. Crystals are hexagonal tablets and prisms to 0.5 mm, that display {100} and {001}, modified by {101} and/or {011}.

**Physical Properties**: *Cleavage*: None. *Fracture*: Conchoidal. *Tenacity*: Brittle. Hardness = 3.5 D(meas.) = n.d. D(calc.) = 5.271

**Optical Properties**: Transparent to translucent. *Color*: Sky-blue. *Streak*: White. *Luster*: Vitreous to resinous.
*Optical Class*: Uniaxial (+). $\omega$ = 1.855(5) $\varepsilon$ = 1.875(5) *Pleochroism*: *E* = sky-blue; *O* = light sky-blue. *Absorption*: *E* > *O*, weak.

**Cell Data**: Space Group: $P\bar{6}$. $a$ = 9.8953(9) $c$ = 10.2054(7) Z = 1

**X-ray Powder Pattern**: Commercial quarry, Crestmore, Riverside County, California, USA. 3.086 (100), 2.734 (83), 3.550 (77), 4.45 (64), 2.847 (60), 3.232 (54), 4.95 (52)

| **Chemistry**: | (1) | (2) |
|---|---|---|
| PbO | 66.08 | 69.60 |
| SrO | 0.15 | |
| CaO | 10.75 | 11.66 |
| MnO | 0.01 | |
| CuO | 0.76 | |
| $SiO_2$ | 19.21 | 18.75 |
| $SO_3$ | 0.59 | |
| Cl | 0.06 | |
| -O = Cl | 0.01 | |
| Total | 97.60 | 100.00 |

(1) Commercial quarry, Crestmore, Riverside County, California, USA; average of 6 electron microprobe analyses supplemented by Raman and IR spectroscopy; corresponds to $(Pb_{8.33}Sr_{0.04}\square_{0.63})_{\Sigma=9.00}(Ca_{5.40}Cu^{2+}_{0.27}\square_{0.33})_{\Sigma=6.00}Si_9S_{0.21}O_{32.64}Cl_{0.05}$. (2) $Pb_9Ca_6(Si_2O_7)_4(SiO_4)O$.

**Occurrence**: As a metasomatic mineral on fracture surfaces in vesuvianite/wollastonite rock.

**Association**: Whelanite, cerussite, nasonite, calcite.

**Distribution**: From the Commercial quarry, Crestmore, Sky Blue Hill, Riverside County, California, USA.

**Name**: Honors the American geochemist-petrologist C. Wayne Burnham (1922-2015), Professor at Pennsylvania State University from 1955-1986 and Adjunct Professor of Geology, Arizona State University for many years. Best known for his seminal research on the role of volatiles in igneous systems, Burnham received the 1998 Roebling Medal from the Mineralogical Society of America.

**Type Material**: Mineral Sciences Department, Natural History Museum of Los Angeles County, Los Angeles, California, USA (65639 and 65640).

**References**: (1) Kampf, A.R., R.M. Housley, and G.R. Rossman (2016) Wayneburnhamite, $Pb_9Ca_6(Si_2O_7)_3(SiO_4)_3$, an apatite polysome: The Mn-free analog of ganomalite from Crestmore, California. Amer. Mineral., 101, 2423-2429.