Alloriite $Na_5K_{1.5}Ca(Si_6Al_6O_{24})(SO_4)\cdot(OH)_{0.5}\cdot H_2O$

Crystal Data: Hexagonal. *Point Group*: 3*m*. Crystals hexagonal equant, tabular on {0001}, or prismatic, to 2 mm, displaying {0001}, {10$\bar{1}$ 0}, {10$\bar{1}$ 3}, {10$\bar{1}$ 4}, {11$\bar{2}$ 0}.

Physical Properties: *Cleavage*: Imperfect on {10$\bar{1}$ 0}. *Fracture*: Conchoidal.
Tenacity: Brittle. Hardness = 5 D(meas.) = 2.35(1) D(calc.) = 2.358

Optical Properties: Transparent. *Color*: Colorless to pale violet. *Streak*: White.
Luster: Vitreous.
Optical Class: Uniaxial (+). ω = 1.497(2) ε = 1.499(2) *Pleochroism*: *E* = pale pink, *O* = pale pinkish yellow. *Absorption: E > O.*

Cell Data: *Space Group*: *P*31*c*. a = 12.892(3) c = 21.340(5) Z = 4

X-ray Powder Pattern: Mt. Cavalluccio, Sacrofano caldera, Latium, Italy.
3.33 (100), 4.85 (90), 3.76 (80), 11.3 (70), 3.68 (70), 2.694 (70), 4.03 (60)

Chemistry:

	(1)	(2)
Na_2O	13.55	14.75
K_2O	6.67	6.72
CaO	6.23	5.34
Al_2O_3	26.45	29.11
SiO_2	34.64	34.31
SO_3	8.92	7.62
Cl	0.37	
H_2O	2.1	2.14
CO_2	0.7	
$-O=Cl_2$	0.08	
Total	99.55	99.99

(1) Mt. Cavalluccio, Sacrofano caldera, Latium, Italy; electron microprobe analysis, water by Penfield method, CO_2 by selective sorption, anionic groups confirmed by IR, corresponding to $Na_{19.16}K_{6.21}Ca_{4.87}(Si_{25.26}Al_{22.74}O_{96})(SO_4)_{4.88}(CO_3)_{0.70}Cl_{0.46}(OH)_{0.76}\cdot 4.73H_2O$ (for Z = 1).
(2) $Na_5K_{1.5}Ca(Si_6Al_6O_{24})(SO_4)\cdot(OH)_{0.5}\cdot H_2O$ (for Z = 4).

Mineral Group: Cancrinite group.

Occurrence: Lining the walls of small miarolitic cavities in a sanidine-syenite volcanic bomb.

Association: Sanidine, biotite, andradite, apatite.

Distribution: Mt. Cavalluccio, Campagnano di Roma, Sacrofano caldera, Rome Province, Latium, Italy.

Name: Honors Roberto Allori (b. 1933), an amateur mineralogist who has studied the Latium region.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 3459/1.

References: (1) Chukanov N V, Rastsvetaeva R K, Pekov I V, Zadov A E (2007) Alloriite, $Na_5K_{1.5}Ca(Si_6Al_6O_{24})(SO_4)\cdot(OH)_{0.5}\cdot H_2O$, a new mineral of the cancrinite group. Zapiski Rossiiskogo Mineralogicheskogo Obshchetstva, 136, 82-89; (2007) Geology of Ore Deposits, Vol. 49, 752–757 (in English). (2) Rastsvetaeva, R.K., A.G. Ivanova, N.V. Chukanov, and I.A. Verin (2007) Crystal structure of alloriite. Dokl. Akad. Nauk, 415(2), 242–246 (in Russian); Dokl. Earth Sci., 415, 815–819 (in English). (3) (2009) Amer. Mineral., 94, 399 (abs. ref. 2).