

Alloriite **$\text{Na}_5\text{K}_{1.5}\text{Ca}(\text{Si}_6\text{Al}_6\text{O}_{24})(\text{SO}_4)\cdot(\text{OH})_{0.5}\cdot\text{H}_2\text{O}$**

Crystal Data: Hexagonal. *Point Group:* 3m. 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 (+). $\omega = 1.497(2)$ $\varepsilon = 1.499(2)$ *Pleochroism:* E = pale pink, O = pale pinkish yellow. *Absorption:* E > O.

Cell Data: *Space Group:* P31c. $a = 12.892(3)$ $c = 21.340(5)$ $Z = 4$

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 ₂ O	13.55	14.75
K ₂ O	6.67	6.72
CaO	6.23	5.34
Al ₂ O ₃	26.45	29.11
SiO ₂	34.64	34.31
SO ₃	8.92	7.62
Cl	0.37	
H ₂ O	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, CO₂ 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}O₉₆)(SO₄)_{4.88}(CO₃)_{0.70}Cl_{0.46}(OH)_{0.76}·4.73H₂O (for Z = 1).

(2) Na₅K_{1.5}Ca(Si₆Al₆O₂₄)(SO₄)·(OH)_{0.5}·H₂O (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, Na₅K_{1.5}Ca(Si₆Al₆O₂₄)(SO₄)·(OH)_{0.5}·H₂O, a new mineral of the cancrinite group. *Zapiski Rossiiskogo Mineralogicheskogo Obshchestva*, 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).