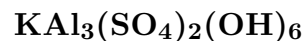


Alunite



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Crystal Data: Hexagonal. *Point Group:* $\bar{3}2/m$ or $3m$. Crystals typically pseudocubic $\{01\bar{1}2\}$ or tabular $\{0001\}$ with flat vicinal rhombohedra, to 1 cm; fibrous to columnar, porcelaneous, commonly granular to dense massive.

Physical Properties: *Cleavage:* On $\{0001\}$, perfect. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 3.5–4 D(meas.) = 2.6–2.9 D(calc.) = 2.82 Strongly pyroelectric.

Optical Properties: Transparent to translucent. *Color:* Colorless if pure; may be white, pale shades of gray, yellow, red, to reddish brown. *Streak:* White. *Luster:* Vitreous, somewhat pearly on $\{0001\}$.

Optical Class: Uniaxial (+). $\omega = 1.572$ $\epsilon = 1.592$

Cell Data: *Space Group:* $R\bar{3}m$ or $R3m$ (synthetic). $a = 6.981(1)$ $c = 17.331(4)$ $Z = 3$

X-ray Powder Pattern: Marysvale, Utah, USA.

2.89 (100), 2.99 (94), 2.293 (76), 1.926 (66), 4.96 (50), 1.503 (34), 5.77 (26)

Chemistry:

	(1)	(2)
SO ₃	38.34	38.66
P ₂ O ₅	0.58	
SiO ₂	0.22	
Al ₂ O ₃	37.18	36.92
Na ₂ O	0.33	
K ₂ O	10.46	11.37
H ₂ O	12.99	13.05
Total	100.10	100.00

(1) Marysvale, Utah, USA. (2) $\text{KAl}_3(\text{SO}_4)_2(\text{OH})_6$.

Polymorphism & Series: Forms a series with natroalunite.

Mineral Group: Alunite group.

Occurrence: Formed between 15 °C and 400 °C by the action of sulfate, which may be generated from pyrite or solfataric action, on aluminous rocks, commonly accompanied by kaolinitization and silicification.

Association: Kaolinite, halloysite, diaspore, pyrite, gypsum, quartz.

Distribution: Many localities, some with deposits of immense size. From Tolfa, 14 km east-northeast of Civitavecchia, Lazio, Italy. At Mukacheve (Muzijeva) and from Beregavo, near Mukachevo, Ukraine. At Rodalquilar, Almeria Province, Spain. From Décazeville, Aveyron, France. In the USA, in a very large deposit near Marysvale, Ohio district, Piute Co., Utah; in Colorado, at South River, Mineral Co., Red Mountain, Hinsdale Co., in the Rosita Hills, Custer Co., and approximately 100 million t in the Calico Peak porphyry, Rico district, Dolores Co.; at Meiklejohn Mountain, near Beatty, Nye Co., Nevada; in Lassen Volcanic National Park, Shasta Co., California. From Hickory's Pond, near Placentia Bay, Newfoundland, Canada. At Hilton, Bernborough, and other localities in the Mount Isa district, Queensland; from Bullah Delah, New South Wales, Australia.

Name: A contraction of the earlier name *aluminilite*.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 556–560. (2) Parker, R.L. (1962) Isomorphous substitution in natural and synthetic alunite. *Amer. Mineral.*, 47, 127–136. (3) Stoffregen, R.E. and C.N. Alpers (1992) Observations on the unit-cell dimensions, H₂O contents, and δD values of natural and synthetic alunite. *Amer. Mineral.*, 77, 1092–1098. (4) Menchetti, S. and C. Sabelli (1976) Crystal chemistry of the alunite series: crystal structure refinement of alunite and synthetic jarosite. *Neues Jahrb. Mineral., Monatsh.*, 406–417.

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