

Giuseppettite

Crystal Data: Hexagonal. *Point Group:* 3m. As anhedral grains, in veinlets a few mm thick. Twinned on (001).

Physical Properties: Hardness = 6-7 D(meas.) = 2.35 D(calc.) = 2.32

Optical Properties: Transparent. *Color:* Pale blue-violet.
Optical Class: Uniaxial (+). $\omega = 1.491$ $\varepsilon = 1.507$

Cell Data: *Space Group:* P31c. $a = 12.856(2)$ $c = 42.256(8)$ $Z = 1$

X-ray Powder Pattern: Sacrofano, Italy.

3.712 (100), 3.446 (80), 3.126 (70), 2.141 (66), 6.42 (62), 2.640 (62), 4.318 (53)

Chemistry:	(1)	(2)
SiO ₂	33.25	32.87
Al ₂ O ₃	28.56	27.79
Fe ₂ O ₃	0.03	
CaO	4.85	4.55
Na ₂ O	14.37	14.06
K ₂ O	8.00	8.12
Cl	0.78	0.63
F	n.d.	0.01
SO ₃	9.92	9.94
H ₂ O	n.d.	1.50
-O = ClF	0.18	0.15
Total	99.58	99.32

(1) Sacrofano, Italy; by electron microprobe, SO₃ confirmed by IR; corresponds to (Na_{5.0}K_{1.8}Ca_{1.0})_{Σ=7.8}(Al_{6.05}Si_{5.95})_{Σ=12.00}O₂₄(SO₄)_{1.8}Cl_{0.25}. (2) Sacrofano, Italy; electron microprobe analysis, IR spectra do not confirm presence of SO₃ and does confirm presence of H₂O and SO₄, H₂O estimated from structure analysis; corresponding to [Na₄₂K₁₆Ca₆]_{Σ=64}Si₄₈Al₄₈O₁₉₂(SO₄)₁₀Cl₂·5H₂O.

Mineral Group: Cancrinite group.

Occurrence: As veinlets in a block of sanidine volcanic ejecta.

Association: Potassic feldspar, nepheline, h auyne, biotite, kalsilite.

Distribution: At Sacrofano, in the Biachella Valley, Lazio, Italy.

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Type Material: University of Pavia, Pavia, and Mineralogical Museum, University of Rome (# 24341), Italy.

References: (1) Mazzi, F. and C. Tadini (1981) Giuseppettite, a new mineral from Sacrofano (Italy), related to the cancrinite group. Neues Jahrb. Mineral., Monatsh., 103-110. (2) (1982) Amer. Mineral., 67, 415 (abs. ref. 1). (3) Bonaccorsi, E. (2004) The crystal structure of giuseppettite, the 16-layer member of the cancrinite-sodalite group. Microporous Mesoporous Mat. 73, 129-136. (4) (2005) Amer. Mineral., 90, 771 (abs. ref. 3). (5) Ballirano, P., A. Mara and P.R. Buseck (1996) Crystal chemistry and IR spectroscopy of Cl- and SO₄-bearing cancrinite-like minerals. Amer. Mineral., 81, 1003-1012.