

**Giuseppettite**

**Crystal Data:** Hexagonal. *Point Group:* 3*m*. 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:* P31*c*.  $a = 12.856(2)$   $c = 42.256(8)$   $Z = 1$

**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)

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

(1) Sacrofano, Italy; by electron microprobe, SO<sub>3</sub> confirmed by IR; corresponds to (Na<sub>5.0</sub>K<sub>1.8</sub>Ca<sub>1.0</sub>)<sub>Σ=7.8</sub>(Al<sub>6.05</sub>Si<sub>5.95</sub>)<sub>Σ=12.00</sub>O<sub>24</sub>(SO<sub>4</sub>)<sub>1.8</sub>Cl<sub>0.25</sub>. (2) Sacrofano, Italy; electron microprobe analysis, IR spectra do not confirm presence of SO<sub>3</sub> and does confirm presence of H<sub>2</sub>O and SO<sub>4</sub>, H<sub>2</sub>O estimated from structure analysis; corresponding to [Na<sub>42</sub>K<sub>16</sub>Ca<sub>6</sub>]<sub>Σ=64</sub>Si<sub>48</sub>Al<sub>48</sub>O<sub>192</sub>(SO<sub>4</sub>)<sub>10</sub>Cl<sub>2</sub>·5H<sub>2</sub>O.

**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 SO<sub>4</sub>-bearing cancrinite-like minerals. *Amer. Mineral.*, 81, 1003-1012.