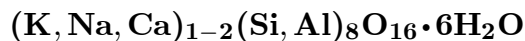


# Phillipsite



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**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . Crystals always twinned, pseudosymmetrical; striated  $\parallel$  [001] on {010}, to 2 cm. Equant to prismatic, or in spherical radiating aggregates.

*Twinning:* Cruciform single and double penetration twins on {001}, {021}, {110}, ubiquitous.

**Physical Properties:** *Cleavage:* {010}, {100}, distinct. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 4–4.5  $D(\text{meas.}) = 2.20$   $D(\text{calc.}) = 2.242$

**Optical Properties:** Translucent to opaque. *Color:* Colorless, white, reddish, yellowish; colorless in thin section. *Streak:* White. *Luster:* Vitreous.

*Optical Class:* Biaxial (+). *Orientation:*  $X = b$ ;  $Y \wedge a = 46^\circ\text{--}65^\circ$ . *Dispersion:*  $r < v$ .  $\alpha = 1.483\text{--}1.504$   $\beta = 1.484\text{--}1.509$   $\gamma = 1.486\text{--}1.514$   $2V(\text{meas.}) = 60^\circ\text{--}80^\circ$

**Cell Data:** *Space Group:*  $P2_1/m$ .  $a = 9.865(2)$   $b = 14.300(4)$   $c = 8.668(2)$   
 $\beta = 124.20(3)^\circ$   $Z = 2$

**X-ray Powder Pattern:** Casal Brunori quarry, near Rome, Lazio, Italy.  
3.206 (100), 7.16 (66), 7.18 (63), 4.12 (41), 3.277 (37), 4.13 (36), 2.753 (36)

## Chemistry:

	(1)
SiO <sub>2</sub>	46.03
Al <sub>2</sub> O <sub>3</sub>	21.43
FeO + Fe <sub>2</sub> O <sub>3</sub>	0.99
CaO	5.73
Na <sub>2</sub> O	3.13
K <sub>2</sub> O	5.59
H <sub>2</sub> O	17.22
Total	100.12

(1) Mazé, Japan; corresponds to  $(\text{K}_{0.79}\text{Na}_{0.68}\text{Ca}_{0.68}\text{Fe}_{0.08})_{\Sigma=2.23}(\text{Si}_{5.12}\text{Al}_{2.81})_{\Sigma=7.93}\text{O}_{16} \cdot 6.39\text{H}_2\text{O}$ .

**Mineral Group:** Zeolite group.

**Occurrence:** Typically in cavities in basalt, of hydrothermal origin; an authigenic mineral in saline lake and hot spring deposits and calcareous deep-sea sediments.

**Association:** Zeolites, apophyllite, calcite, nosean, nepheline, olivine, melilite, celadonite.

**Distribution:** Many localities, although uncommon in large crystals. Well authenticated localities include: from Aci Castello, Sicily, and at Capo di Bove and other localities around Rome, Lazio, Italy. At Annerod, near Giessen, Hesse, and Asbach, Westerwald, Germany. Along the Giant's Causeway, Co. Antrim, Ireland. In the USA, from Oregon, at Wall Creek, near Monument, and Mount Vernon, Grant Co.; at Cape Lookout, Tillamook Co.; Spray, Wheeler Co.; and many other localities. At Mazé, Niigata Prefecture, Japan. At Richmond, Victoria, and Gads Hill, near Liena, Tasmania, Australia.

**Name:** For William Phillips (1775–1828), noted British mineralogist.

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