# Phenakite $Be_2SiO_4$



**Crystal Data:** Hexagonal. *Point Group:* $\bar{3}$. Crystals rhombohedral, tabular to prismatic, less commonly long prismatic to acicular, to 20 cm. In columnar aggregates, as spherulites, and granular. *Twinning:* Penetration twins, by rotation about [0001].

**Physical Properties:** *Cleavage:* Distinct on $\{11\bar{2}0\}$, imperfect on $\{10\bar{1}1\}$.
*Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 7.5–8 D(meas.) = 2.93–3.00
D(calc.) = 2.960 Bright blue cathodoluminescence.

**Optical Properties:** Transparent to translucent. *Color:* Colorless, yellow, pink, brown; may be mottled. *Luster:* Vitreous.
*Optical Class:* Uniaxial (+). $\omega = 1.650–1.656$ $\epsilon = 1.667–1.670$

**Cell Data:** *Space Group:* $R\bar{3}$. $a = 12.472$ $c = 8.252$ Z = 18

**X-ray Powder Pattern:** Minas Gerais, Brazil.
3.119 (100), 3.66 (80), 2.518 (75), 2.358 (70), 2.187 (60), 2.079 (50), 6.24 (40)

**Chemistry:**

| | (1) | (2) |
|---|---|---|
| $SiO_2$ | 52.92 | 54.57 |
| $Al_2O_3$ | trace | |
| BeO | 45.82 | 45.43 |
| MgO | 0.13 | |
| CaO | 0.20 | |
| $Na_2O$ | 0.63 | |
| $K_2O$ | 0.26 | |
| LOI | 0.21 | |
| Total | 100.17 | 100.00 |

(1) Ural Mountains, Russia. (2) $Be_2SiO_4$.

**Occurrence:** In pegmatites, greisens, and alpine and hydrothermal veins.

**Association:** Topaz, beryl, chrysoberyl, fluorite, muscovite, quartz.

**Distribution:** Numerous localities; some for fine crystals are: along the Tokovaya River, near Yekaterinburg (Sverdlovsk), Ural Mountains, and at Miass, Ilmen Mountains, Southern Ural Mountains, Russia. At several places around Kragerö, Norway. In France, in the Vosges Mountains, at Framont, Alsace. From near Reckingen, Valais, and many other places in Switzerland. At Leckbachrinne, Habachtal, Salzburg, Austria. In the USA, from near Florissant, El Paso Co., and on Mt. Antero, Chaffee Co., Colorado; on Bald Face Mountain, North Chatham, Carroll Co., New Hampshire; at Amelia, Amelia Co., Virginia. In Brazil, exceptional crystals in the São Miguel de Piracicaba pegmatite, 50 km east of Belo Horizonte, and at Catuqi, Minas Gerais; in the Socotó mine, northwest of Salvador, Bahia, and elsewhere. At Klein Spitzkopje, Namibia. From Anjanabonoina, Madagascar.

**Name:** From the Greek for *deceiver*, in allusion to its similarity to quartz when colorless.

**Type Material:** Mining Institute, St. Petersburg, Russia, 617/22.

**References:** (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 462–463.
(2) Pough, F.H. (1936) Phenakit, seine Morphologie und Paragenesis. Neues Jahrb. Mineral., Monatsh., 71, 291–341 (in German). (3) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 81–85. (4) Zachariasen, W.H. (1971) Refined crystal structure of phenacite $Be_2SiO_4$. Kristallografiya (Sov. Phys. Crystal.), 16, 1161–1166 (in Russian). (5) (1959) NBS Circ. 539, 8, 11–13.