

**Crystal Data:** Orthorhombic. *Point Group:* *mm*2. As well-formed single and twinned hemimorphic crystals, to 1 mm; forms include {010}, {011}, {100}, { $\bar{1}00$ }, { $\bar{1}01$ }, {101}, and {120}. *Twining:* Common, by interpenetration of individuals related by a half-turn about [023]; the [100] axes of twinned crystals are parallel, with [010] of one 14° from [001] of the other.

**Physical Properties:** *Fracture:* Conchoidal. Hardness = 5 D(meas.) = 2.70(2)  
D(calc.) = 2.689

**Optical Properties:** Semitransparent. *Color:* Colorless to white.  
*Optical Class:* Biaxial (-). *Orientation:* X = a; Y = b; Z = c.  $\alpha = 1.578(1)$   $\beta = 1.597(1)$   
 $\gamma = 1.606(1)$  2V(meas.) = 67° 2V(calc.) = 68°

**Cell Data:** *Space Group:* *P*2<sub>1</sub>*nb*. *a* = 11.836(4) *b* = 12.940(6) *c* = 6.735(4) Z = 4

**X-ray Powder Pattern:** Wind Mountain, New Mexico, USA; very similar to gaidonnayite.  
3.12 (100), 6.46 (73), 5.95 (70), 5.67 (52), 5.83 (32), 2.829 (22), 2.201 (21)

Chemistry:	(1)	(2)
SiO <sub>2</sub>	43.18	43.16
TiO <sub>2</sub>	0.11	
ZrO <sub>2</sub>	29.03	29.51
FeO	0.15	
Na <sub>2</sub> O	7.54	7.42
K <sub>2</sub> O	10.75	11.28
H <sub>2</sub> O	[9.21]	8.63
Total	[99.97]	100.00

(1) Wind Mountain, New Mexico, USA; by electron microprobe, average of several analyses, H<sub>2</sub>O estimated by analogy to gaidonnayite. (2) NaKZrSi<sub>3</sub>O<sub>9</sub>•2H<sub>2</sub>O.

**Occurrence:** In miarolitic cavities in analcime-bearing nepheline syenite (Wind Mountain, New Mexico, USA); in a carbonatite, in dolomitic veinlets cutting metasomatically altered pyroxenites, apparently altering from catapleiite (Vuoriyarvi complex, Russia).

**Association:** Microcline, nepheline, aegirine, catapleiite, monazite, chlorite (Wind Mountain, New Mexico, USA); dolomite, strontianite, phlogopite, barite, komkovite, pyrite (Vuoriyarvi complex, Russia).

**Distribution:** On Wind Mountain, Otero Co., New Mexico, USA. In the Vuoriyarvi carbonatite complex, Kola Peninsula, Russia. From Poços de Caldas, Minas Gerais, Brazil.

**Name:** Honors Professor George Y. Chao, of Carleton University, Toronto, Canada, for his studies of zirconium silicates.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 161902.

**References:** (1) Boggs, R.C. and S. Ghose (1985) Georgechaoite NaKZrSi<sub>3</sub>O<sub>9</sub>•2H<sub>2</sub>O, a new mineral species from Wind Mountain, New Mexico. *Can. Mineral.*, 23, 1–4. (2) Ghose, S. and P. Thakur (1985) The crystal structure of georgechaoite NaKZrSi<sub>3</sub>O<sub>9</sub>•2H<sub>2</sub>O. *Can. Mineral.*, 23, 5–10. (3) (1986) *Amer. Mineral.*, 71, 227 (abs. refs. 1 and 2).