

## Carbokentbrooksit (Na, □)<sub>12</sub>(Na, Ce)<sub>3</sub>Ca<sub>6</sub>Mn<sub>3</sub>Zr<sub>3</sub>Nb(Si<sub>25</sub>O<sub>73</sub>)(OH)<sub>3</sub>(CO<sub>3</sub>)·H<sub>2</sub>O

**Crystal Data:** Hexagonal. *Point Group:* 3m. Displays {10 $\bar{1}$ 1}, {10 $\bar{1}$ 2}, {01 $\bar{1}$ 0}, and {0001} in rhombohedral crystals zoned with zirsilit-(Ce), to 2 cm.

**Physical Properties:** *Cleavage:* None. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 5 VHN = n.d. D(meas.) = 3.14(2) D(calc.) = 3.10

**Optical Properties:** Transparent. *Color:* Yellow. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Uniaxial (-).  $\omega = 1.645(2)$   $\varepsilon = 1.637(2)$

**Cell Data:** *Space Group:* R3m.  $a = 14.237(2)$   $c = 30.033(5)$   $Z = 3$

**X-ray Powder Pattern:** Dara-i-Pioz massif, northern Tajikistan.

2.849 (100), 2.970 (83), 3.204 (38), 3.155 (35) 3.019 (34), 2.590 (30), 6.39 (25)

Chemistry:	(1)		(1)
Na <sub>2</sub> O	10.17	Y <sub>2</sub> O <sub>3</sub>	0.43
K <sub>2</sub> O	0.51	SiO <sub>2</sub>	45.55
CaO	10.61	TiO <sub>2</sub>	0.41
SrO	1.42	ZrO <sub>2</sub>	11.07
FeO	2.22	Nb <sub>2</sub> O <sub>5</sub>	3.55
MnO	5.41	Cl	0.29
La <sub>2</sub> O <sub>3</sub>	1.79	H <sub>2</sub> O	1.18
Ce <sub>2</sub> O <sub>3</sub>	2.97	CO <sub>2</sub>	0.78
Pr <sub>2</sub> O <sub>3</sub>	0.24	<u>- O = Cl</u>	<u>0.06</u>
Nd <sub>2</sub> O <sub>3</sub>	0.76	Total	99.30

(1) Dara-i-Pioz massif, northern Tajikistan; electron microprobe analysis, H<sub>2</sub>O by Penfield method; corresponds to (Na<sub>9.43</sub>Ca<sub>0.90</sub>K<sub>0.36</sub>) $\Sigma=10.69$ [Na<sub>1.39</sub>(Ce<sub>0.60</sub>La<sub>0.36</sub>Nd<sub>0.15</sub>Pr<sub>0.05</sub>) $\Sigma=1.16$ Sr<sub>0.45</sub>] $\Sigma=3.00$ (Ca<sub>5.34</sub>Mn<sub>0.54</sub>Y<sub>0.12</sub>) $\Sigma=6.00$ (Mn<sub>1.98</sub>Fe<sub>1.02</sub>) $\Sigma=3.00$ (Zr<sub>2.96</sub>Ti<sub>0.04</sub>) $\Sigma=3.00$ (Nb<sub>0.88</sub>Ti<sub>0.13</sub>) $\Sigma=1.01$ Si<sub>25</sub>O<sub>74.11</sub>[(OH)<sub>2.73</sub>Cl<sub>0.27</sub>] $\Sigma=3.00$ (CO<sub>3</sub>)<sub>0.58</sub>·0.80H<sub>2</sub>O.

**Mineral Group:** Eudialyte group.

**Occurrence:** In the quartz core of a zoned pegmatite in the Dara-i-Pioz alkaline massif.

**Association:** Zirsilit-(Ce), quartz, microcline, aegirine, stillwellite-(Ce), ekanite, polyolithionite, pyrochlore, fluorite, calcite, galena.

**Distribution:** From the Dara-i-Pioz alkaline massif, northern Tajikistan.

**Name:** For the compositional relationship (*carbonate*) to *kentbrooksit*.

**Type Material:** A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia.

**References:** (1) Kohmyakov, A.P., V.D. Dusmatov, G. Ferraris, A. Gula, G. Ivaldi, and G.N. Nechelyustov (2003) Zirsilit-(Ce), (Na, □)<sub>12</sub>(Ce, Na)<sub>3</sub>Ca<sub>6</sub>Mn<sub>3</sub>Zr<sub>3</sub>Nb(Si<sub>25</sub>O<sub>73</sub>)(OH)<sub>3</sub>(CO<sub>3</sub>)·H<sub>2</sub>O, and carbokentbrooksit (Na, □)<sub>12</sub>(Na, Ce)<sub>3</sub>Ca<sub>6</sub>Mn<sub>3</sub>Zr<sub>3</sub>Nb(Si<sub>25</sub>O<sub>73</sub>)(OH)<sub>3</sub>(CO<sub>3</sub>)·H<sub>2</sub>O - two new eudialyte-group minerals from the Dara-i-Pioz alkaline massif, Tajikistan. *Zapiski Vseross. Mineral. Obshch.*, 132(5), 40-51 (in Russian, English abs.). (2) (2004) *Amer. Mineral.*, 89, 1826 (abs. ref. 1).