Zirsilite-(Ce) $(Na, \square)_{12}(Ce, Na)_3Ca_6Mn_3Zr_3Nb(Si_{25}O_{73})(OH)_3(CO_3)\cdot H_2O$

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

Physical Properties: *Cleavage:* None. *Fracture*: Conchoidal. *Tenacity*: Brittle.
Hardness = 5 VHN = n.d. D(meas.) = 3.15(2) D(calc.) = 3.10

Optical Properties: Transparent. *Color:* Creamy white. *Streak:* White. *Luster:* Vitreous.
Optical Class: Uniaxial (-). ω = 1.648(2) ε = 1.637(2)

Cell Data: *Space Group*: *R*3*m*. *a* = 14.29(1) *c* = 30.02(4) Z = 3

X-ray Powder Pattern: Dara-i-Pioz massif, northern Tajikistan.
3.220 (100), 2.979 (95), 2.857 (66), 3.166 (56), 4.32 (51), 3.975 (37), 2.597 (34)

Chemistry:

	(1)		(1)
Na_2O	9.54	Y_2O_3	0.47
K_2O	0.45	SiO_2	45.63
CaO	10.52	TiO_2	0.45
SrO	1.35	ZrO_2	10.48
FeO	1.89	Nb_2O_5	3.76
MnO	5.67	Cl	0.32
La_2O_3	2.31	H_2O	1.52
Ce_2O_3	3.78	CO_2	0.58
Pr_2O_3	0.28	- O = Cl	0.07
Nd_2O_3	0.82	Total	99.75

(1) Dara-i-Pioz massif, northern Tajikistan; electron microprobe analysis, H_2O by Penfield method; corresponds to $(Na_{9.04}Ca_{0.94}K_{0.32})_{\Sigma=10.78}(Na_{1.12}Ce_{0.76}La_{0.47}Sr_{0.43}Nd_{0.16}Pr_{0.06})_{\Sigma=3.00}(Ca_{5.25}Mn_{0.61}Y_{0.14})_{\Sigma=6.00}(Mn_{2.03}Fe_{0.87})_{\Sigma=2.90}(Zr_{2.81}Ti_{0.19})_{\Sigma=3.00}Nb_{0.93}Si_{25.07}O_{74.27}[(OH)_{2.70}Cl_{0.30}]_{\Sigma=3.00}(CO_3)_{0.43}\cdot 1.44H_2O$.

Mineral Group: Eudialyte group.

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

Association: Carbokentbrooksite, quartz, microcline, aegirine, stillwellite-(Ce), ekanite, pyrochlore, polylithionite, fluorite, calcite, galena.

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

Name: For the essential composition, *zir*conium *sil*icate and the suffix indicates *ce*sium as the dominant rare earth element.

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) Zirsilite-(Ce), $(Na,\square)_{12}(Ce,Na)_3Ca_6Mn_3Zr_3Nb(Si_{25}O_{73})(OH)_3(CO_3)\cdot H_2O$, and carbokentbrooksite $(Na,\square)_{12}(Na,Ce)_3Ca_6Mn_3Zr_3Nb(Si_{25}O_{73})(OH)_3(CO_3)\cdot H_2O$ - 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).