Odigitriaite $CsNa_5Ca_5[Si_{14}B_2O_{38}]F_2$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As irregular elongated grains to 100 μm.

Physical Properties: *Cleavage*: Perfect on {001}. *Tenacity*: Brittle. *Fracture*: Uneven. Hardness = 5 VHN = 606 (50 g load). D(meas.) = 2.80(2) D(calc.) = 2.830

Optical Properties: Translucent. *Color*: Colorless; colorless in transmitted light. *Streak*: White. *Luster*: Vitreous.
Optical Class: Biaxial (–). α(calc.) = 1.502 β = 1.564(2) γ = 1.576(2) 2V(meas.) = 46(2)°
Dispersion: Weak, $r > v$.

Cell Data: *Space Group*: *C*2/*c*. a = 16.652(5) b = 9.598(3) c = 22.120(7) β = 92.875(14)° Z = 4

X-ray Powder Pattern: Calculated pattern.
3.35 (100), 3.04 (60), 3.62 (45), 2.68 (40), 4.10 (36), 3.25 (35), 4.66 (33)

Chemistry:	(1)
SiO_2	55.30
Y_2O_3	0.44
Al_2O_3	0.09
B_2O_3	4.75
PbO	0.21
FeO	0.10
MnO	0.94
CaO	17.37
Cs_2O	8.36
K_2O	0.01
Na_2O	10.49
F	1.74
H_2O	[0.37]
$– O = F_2$	0.74
Total	99.43

(1) Darai-Pioz alkaline massif, Tajikistan; average of 10 electron microprobe analyses, H_2O from structure analysis; corresponding to $Cs_{0.90}Na_{5.12}Ca_{4.68}Mn_{0.20}Y_{0.06}Fe_{0.02}Pb_{0.01}[Si_{13.92}Al_{0.03}B_{2.06}O_{38}]F_{1.39}(OH)_{0.62}$.

Occurrence: In glacial cobbles in moraine derived from an alkaline massif.

Association: Sr-rich fluorite, pekovite, mendeleevite-(Ce), orlovite, kirchhoffite, neptunite, zeravshanite, senkevichite, nordite-(Ce), alamosite, hyalotekite, khvorovite.

Distribution: From the Darai-Pioz alkaline massif, Tajikistan.

Name: From the Greek Οδηγήτρια, meaning "*she who shows the way*," to emphasize the role of Cs as a major indicator of extreme fractionation.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4706/1).

References: (1) Agakhanov, A.A., L.A. Pautov, E. Sokolova, F.C. Hawthorne, V.Yu. Karpenko, O.I. Siidra, and V.A. Muftakhov (2017) Odigitriaite, $CsNa_5Ca_5[Si_{14}B_2O_{38}]F_2$, a new cesium borosilicate mineral from the Darai-Pioz alkaline massif, Tajikistan: Description and crystal structure. Mineral. Mag., 81(1), 113-122. (2) (2017) Amer. Mineral., 102, 1568-1569 (abs. ref. 1).