Belogubite $CuZn(SO_4)_2 \cdot 10H_2O$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As aggregates of grains to 1 mm.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: n.d. Hardness = ~2.5
D(meas.) = 2.27(2) D(calc.) = 2.249

Optical Properties: Transparent. *Color*: Pale to light blue. *Streak*: White. *Luster*: Vitreous.
Optical Class: Biaxial (-). α = 1.512(2) β = 1.525(2) γ = 1.531(2) 2V(meas.) = 70(10)°
2V(calc.) = 67.9° *Dispersion*: Noticeable, $r < v$. Non-pleochroic.

Cell Data: *Space Group: P*$\bar{1}$. a = 6.2548(1) b = 10.6112(2) c = 6.0439(1) α = 82.587(1)°
β = 109.625(1)° γ = 104.848(1)° Z = 1

X-Ray Diffraction Pattern: Gayskoe Zn-Cu deposit, Orenburgskaya region, South Urals, Russia.
4.873 (100), 5.576 (47), 3.719 (45), 5.73 (35), 3.907 (31), 3.229 (27), 2.684 (26)

Chemistry:

	(1)	(2)
MgO	1.12	
MnO	0.10	
FeO	3.15	
CuO	8.98	15.83
ZnO	18.02	16.18
SO_3	32.49	32.01
H_2O	36.75	35.98
Total	100.61	100.00

(1) Gayskoe Zn-Cu deposit, Orenburgskaya region, South Urals, Russia; average electron microprobe and Raman spectroscopic analyses, H_2O determined by thermogravimetry; corresponding to $(Cu_{0.55}Zn_{0.45})_{\Sigma=1.00}(Zn_{0.64}Fe_{0.22}Mg_{0.14}Mn_{0.01})_{\Sigma=1.01}S_{1.99}O_{7.98} \cdot 10.02H_2O$.
(2) $CuZn(SO_4)_2 \cdot 10H_2O$.

Mineral Group: Chalcanthite group.

Occurrence: Secondary in the weathered zone of a Zn-Cu massive sulfide deposit.

Association: Dietrichite.

Distribution: From the Gayskoe Zn-Cu deposit, Orenburgskaya region, South Urals, Russia.

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Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (5130/1).

References: (1) Kasatkin, A.V., S.N. Britvin, N.V. Chukanov, R. Škoda, A.A. Agakhanov, and D.I. Belakovskiy (2019) Belogubite, a new mineral of the chalcanthite group from the Gayskoe deposit, South Urals, Russia. Zap. Ross. Mineral. Obshch., 148(3), 30-43 (Russian, English abs.).