Clinohedrite $CaZnSiO_4 \cdot H_2O$

Crystal Data: Monoclinic. *Point Group:* m. Crystals typically prismatic or tabular, to 4 mm; may be wedge-shaped reflecting the domatic class in which the species crystallizes.

Physical Properties: *Cleavage:* Perfect on {010}. Hardness = 5.5 D(meas.) = 3.28–3.335 D(calc.) = [3.32] Strongly pyroelectric.

Optical Properties: Transparent to translucent. *Color:* Amethystine, colorless to white. *Luster:* Brilliant, glassy; pearly on {010}.
Optical Class: Biaxial (–). *Orientation:* $Z = b$; $Y \wedge c = 28°$. $\alpha = 1.662$ $\beta = 1.667$ $\gamma = 1.669$ 2V(meas.) = Large.

Cell Data: *Space Group:* Cc. $a = 5.090$–5.131 $b = 15.829$–15.928 $c = 5.386$–5.422 $\beta = 103.39°-103.43°$ Z = 4

X-ray Powder Pattern: Franklin, New Jersey, USA. (ICDD 17-214).
2.76 (100), 3.23 (70), 2.50 (60), 7.81 (50), 3.97 (50), 2.36 (50), 2.47 (40)

Chemistry:

	(1)	(2)	(3)
SiO_2	27.22	26.73	27.87
$(Fe, Al)_2O_3$	0.28	0.37	
MnO	0.50	1.11	
ZnO	37.44	37.13	37.76
MgO	0.07		
CaO	26.25	26.25	26.01
H_2O^+	8.56	8.09	8.36
Total	100.32	99.68	100.00

(1) Franklin, New Jersey, USA; average of two analyses. (2) Do. (3) $CaZnSiO_4 \cdot H_2O$.

Occurrence: In a metamorphosed stratiform zinc orebody (Franklin, New Jersey, USA).

Association: Hancockite, nasonite, glaucochroite, roeblingite, calcite, willemite, axinite, larsenite, hodgkinsonite, franklinite (Franklin, New Jersey, USA); stringhamite, kinoite, apophyllite (Christmas mine, Arizona, USA).

Distribution: From Franklin, Sussex Co., New Jersey; in the Christmas mine, Gila Co., Arizona, USA.

Name: From the Greek *klino*, for *incline*, and *hedra*, for *face*, for the inclined facial character of the crystal morphology.

Type Material: Yale University, New Haven, Connecticut, 2.4855; Harvard University, Cambridge, Massachusetts, USA, 131872.

References: (1) Dana, E.S. (1899) Dana's system of mineralogy, (6th edition), app. I, 17–18. (2) Palache, C. (1935) The minerals of Franklin and Sterling Hill, Sussex County, New Jersey. U.S. Geol. Sur. Prof. Paper 180, 106–108. (3) Venetopoulos, C.C. and P.J. Rentzeperis (1976) Redetermination of the crystal structure of clinohedrite, $CaZnSiO_4 \cdot H_2O$. Zeits. Krist., 144, 377–392. (4) Simonov, M.A., E.L. Belokoneva, Y.K. Yegorov-Tismenko, and N.V. Belov (1977) Crystal structure of clinohedrite $CaZn[SiO_4] \cdot H_2O$. Doklady Acad. Nauk SSSR, 237, 334–337 (in Russian). (5) (1978) Chem. Abs., 88, 107998 (abs. ref. 4).