

MinIdent-Win - cryolite

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Formula: Na₃AlF₆

Status: Mineral name is IMA approved or traditional

Level: Species

Parents: fluorides

Symmetry: Monoclinic

Mean Atomic Number: 10.2

Diffraction Values: 2.749, 1.946, 3.888, 4.545, 4.435

Kretz abbreviation: Crl

First Described in 1799

Space Group: P2

Z number: 2

ICDD (TM) Number: 25-772

	Minimum	Maximum	Average	Std. Dev.
a (A)	7.540	7.780	7.660	
b (A)	5.600	5.701	5.651	
c (A)	5.400	5.437	5.419	
Alpha	90.000	90.000	90.000	
Beta	89.460	90.200	89.830	
Gamma	90.000	90.000	90.000	
Volume	227.999	241.150	234.528	

	Minimum	Maximum	Average	Std. Dev.
n(Alpha)	1.338	1.338	1.338	
n(Beta)	1.338	1.338	1.338	
n(Gamma)	1.339	1.339	1.339	
Max. birefrin	0.001	0.001	0.001	
2V Gamma	43	43	43	

Optical Sign: +ve **OAP Orientation:** Perp (010)

C(Alpha)	<input type="text"/>	Colourless
C(Beta)	<input type="text"/>	Colourless
C(Gamma)	<input type="text"/>	Colourless
Dispersion	V>R	

	Minimum	Maximum	Average	Std. Dev.
Mohs	2.5	2.5	2.5	
Vickers	65	65	65	
Density	2.97	2.98	2.97	

	Total Min Wt (%)	Anal. Min Wt (%)	Average Wt (%)	Anal. Max Wt (%)	Total Max Wt (%)	Average Atomic	Coordination
H	0.0000	0.0000	0.0168	0.0336	0.0336	0.0352	
O	0.0000	0.0000	0.1289	0.3867	0.3867	0.0170	
F	53.5500	53.5500	53.9933	54.2800	54.8416	6.0000	
Na	32.4000	32.4000	32.4567	32.5600	33.1792	2.9808	12
Al	12.7222	12.8100	12.9633	13.0700	13.0700	1.0145	6
Ca	0.0000	0.0000	0.1400	0.2800	0.2800	0.0074	
Fe	0.0000	0.0000	0.1399	0.2798	0.2798	0.0053	
Total			99.8390			10.0601	

Atomic proportions calculated for F = 6.0

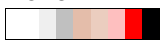
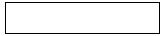
Compilation based on 3 general and 3 sample records

Values in italics are calculated from the minimum and maximum values. Other data are from the sample and general records.

Lustre Vitreous, Pearly, Greasy
Aggregation Massive, Granular, Compact, Lamellar

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Habit	Cubic, Octahedral, Prismatic, Equant
Tenacity	Brittle, Fragile
Fracture	Uneven
Cleavage	None
Surface Colour	 Colourless, White, Pale Grey, Grey, Brownish White, Pale Brown, Pale Red, Red, Black
Streak	 Colourless, White

Comp. Plan.	Comp. Surf.	Twin Plane	Twin Axis	Notes
			[110]	Penetration, Polysynthetic
			[110]	Polysynthetic
			[021]	Polysynthetic

Notes on hand specimen data: Several other twin laws reported. Rare crystals may form sub-parallel groupings. Masses have the appearance of snow-ice.

Remarks: Usually colourless or white but sometimes yellow, brown, reddish, black or grey. The streak is white and the lustre vitreous to greasy. Brittle with an uneven fracture and no cleavage. Usually massive and coarsely granular.

Occurrences: In certain alkali pegmatites, associated with quartz, feldspar, astrophyllite, riebeckite, zircon and many other minerals. Also in some carbonatites. At Ivigtut it is associated with siderite, sphalerite, galena and various Al-fluorides.

Localities of samples used in compilation: Ivigtut, Greenland. Mt. St. Hilaire, Québec, Canada. St. Peter's Dome, El Paso County, Colorado, U.S.A.

References: Dana (7th) v.2, p.110-113. Roberts et al. (1974) *Encycl. Mins.* Mandarino & Anderson, 1989. Phillips & Griffen (1981) *Opt. Min.*

MinIdent-Win

Cryolite & siderite



Cryolite & siderite. Copyright © 2000, Micronex Ltd.

2.0 cm

Dorian G.W. Smith

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Caption: The siderite in this image shows a rather typical, variable brown colour and also the perfect cleavage characteristic of the rhombohedral carbonates. It is intergrown here with white to colourless cryolite [Na₃AlF₆] and a little pyrite and chalcocopyrite. The Ivigtut locality which provided this specimen was the world's only large cryolite deposit discovered to date. It is now largely worked out. Locality: Ivigtut, Greenland.

Keywords: cryolite; fluorides; halides; siderite; carbonates; perfect cleavage; rhombohedral cleavage; Ivigtut; Greenland

Acknowledgements: From the collections of the University of Alberta (specimen no. 175). Photography by Dorian Smith.