

MinIdent-Win - kyanite

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Formula: Al_2SiO_5

Status: Mineral name is IMA approved or traditional

Level: Species

Parents: nesosilicates

Symmetry: Triclinic

Mean Atomic Number: 10.8

Diffraction Values: 3.180, 1.380, 3.350, 1.960, 1.940

Kretz abbreviation: Ky

First Described in 1789

Space Group: P-1




Z number: 4

ICDD (TM) Number: 11-46

	Minimum	Maximum	Average	Std. Dev.
a (A)	7.100	7.121	7.120	
b (A)	7.740	7.851	7.849	
c (A)	5.570	5.588	5.580	
Alpha	89.977	90.130	90.053	
Beta	101.033	101.121	101.111	
Gamma	105.742	106.010	105.998	
Volume	288.738	294.142	293.677	

	Minimum	Maximum	Average	Std. Dev.
n(Alpha)	1.710	1.718	1.713	
n(Beta)	1.719	1.724	1.721	
n(Gamma)	1.724	1.734	1.728	
Max. birefringence	0.015	0.016	0.015	
2V Gamma	97	102	99	

Optical Sign: -ve

C(Alpha)		Colourless
C(Beta)		Pale Blue, Violetish Blue, Colourless
C(Gamma)		Dark Blue, Pale Blue, Colourless
Dispersion	R>V	

	Minimum	Maximum	Average	Std. Dev.
Mohs	4.0	7.5	6.0	
Vickers	265	1343	771	
Density	3.29	3.69	3.59	0.12

	Total Min Wt (%)	Anal. Min Wt (%)	Average Wt (%)	Anal. Max Wt (%)	Total Max Wt (%)	Average Atomic	Coordination
H	0.0000	0.0000	0.0192	0.0884	0.0884	0.0309	
O	48.3657	48.3657	49.2214	49.5298	49.8612	5.0000	
F	0.0000	0.0000	0.0094	0.1400	0.1400	0.0008	
Na	0.0000	0.0000	0.0515	0.3190	0.3190	0.0036	
Mg	0.0000	0.0000	0.0173	0.1267	0.1267	0.0012	
Al	29.7121	29.7121	32.6253	33.6921	33.6921	1.9654	6
Si	16.5847	16.5847	17.2283	17.6552	17.6552	0.9968	4
K	0.0000	0.0000	0.1032	0.7222	0.7222	0.0043	
Ca	0.0000	0.0000	0.0429	0.2216	0.2216	0.0017	
Ti	0.0000	0.0000	0.0375	0.2578	0.2578	0.0013	
Cr	0.0000	0.0000	0.2998	4.7826	4.7826	0.0094	6
Mn	0.0000	0.0000	0.0003	0.0046	0.0046	0.0000	
Fe	0.0000	0.0699	0.4635	1.1191	1.1191	0.0135	
Total			100.1196			8.0289	







Atomic proportions calculated for O = 5.0

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Compilation based on 4 general and 17 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
Aggregation	Massive, Radiating, Columnar
Habit	Bladed, Tabular, Prismatic, Fibrous
Tenacity	Brittle
Fracture	Uneven
Cleavage	{100} Excellent, {010} Good
Surface Colour	 Blue, Pale Blue, White, Colourless, Pale Grey, Pale Green, Green, Grey
Streak	 Colourless, White
Fluor. Short	 Red
Fluor. Unspec	 Pink, Red, Cream, White
Fluor. Long	 Red
Other lumin.	 Cathodoluminescent: Dark Red, Red, Reddish Violet, Violet, Dark Violet

Comp. Plan.	Comp. Surf.	Twin Plane	Twin Axis	Notes
		{100}	[001]	Lamellar
		{001}		Multiple

Polymorphs: sillimanite, andalusite

Synonyms: cyanite, disthene, munkrudite

Remarks: Transparent to translucent and blue, green, grey, white, pink or nearly black, with vitreous to pearly lustre. Crystals are bladed, being flattened parallel to {100} and are usually without well-formed terminal faces. There is a discernible difference in Mohs' hardness in different directions - 4 along the length and 7 across it. Like sillimanite, the mineral sometimes displays bright red cathodoluminescence.

Occurrences: A common mineral in higher grades of regionally metamorphosed pelitic rocks. In schists, gneisses and granitic pegmatites. Also in eclogite. As inclusions in diamond.

Localities of samples used in compilation: Goat Mtn., Boehls Butte quadrangle, Idaho; Celo mines, Burnsville and Yancy County, North Carolina; Clakesville and Graves Mtn., Georgia; U.S.A. Selecka Mtns., southern Serbia, Yugoslavia. Fereczfalva, southern Carpathians, Romania. Hallsjoberget, Varmland and Gothenburg, Sweden. Rouergue area, Massif Central, France. Alpe Sponda, Pizzo Forno, Tessin, Switzerland. Glen Clova, Angus, Scotland. Vrungwe district, Zimbabwe. Saidapuram, Nellore, India.

References: Deer et al. (1962) v.1, p.137-144; (1982) v.1A, p.780-800. Min. Mag. v.50, p.535-537. Roberts et al. (1974) Encycl. Mins. USGS Bull. 1627.

MinIdent-Win

Kyanite in quartz



Dorian G.W. Smith

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Caption: Bladed, blue kyanite crystals are set in massive, glassy quartz. The blue colour is typical and the crystals never show clear terminations. Here the perfect {100} and good {010} cleavages, together with the parting parallel to {001}, can be seen in different places on the specimen. Imprints of the vertically striated faces are well seen on the quartz (for example, near the top of the specimen). Locality: Goshen, Hampshire Co., Massachusetts, U.S.A.

Keywords: quartz; disthene; Goshen; Hampshire County; Massachusetts; U.S.A.; kyanite; bladed; differential hardness; nesosilicates; tectosilicates; vitreous lustre

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