

MinIdent-Win - diopside

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Formula: Ca(Mg,Fe)Si₂O₆

Status: Mineral name is IMA approved or traditional

Level: Species

Parents: diopside-hedenbergite-series and diopside-johannsenite-series

Symmetry: Monoclinic

Mean Atomic Number: 12.8

Diffraction Values: 2.986, 2.524, 2.902, 2.518, 3.230

Kretz abbreviation: Di

First Described in 1800

Space Group: C2/c




Z number: 4

ICDD (TM) Number: 11-654

	Minimum	Maximum	Average	Std. Dev.
a (A)	9.657	9.761	9.720	
b (A)	8.825	8.926	8.858	
c (A)	5.248	5.360	5.283	
Alpha	90.000	90.000	90.000	
Beta	105.800	106.608	106.082	
Gamma	90.000	90.000	90.000	
Volume	430.352	447.517	437.097	

	Minimum	Maximum	Average	Std. Dev.
n(Alpha)	1.664	1.741	1.692	0.022
n(Beta)	1.660	1.735	1.692	0.018
n(Gamma)	1.694	1.762	1.719	0.019
Max. birefringence	0.020	0.031	0.026	
2V Gamma	0	77	56	

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

C(Alpha)		Pale Green, Reddish Purple, Colourless
C(Beta)		Pale Greenish Brown, Pale Yellowish Green, Colourless
C(Gamma)		Pale Yellow, Pale Green, Pale Brownish Green, Pale Yellowish Green, Colourless
Dispersion	R>V	

	Minimum	Maximum	Average	Std. Dev.
Mohs	5.5	6.5	6.0	
Vickers	618	943	771	
Density	2.96	3.60	3.33	0.08

	Total Min Wt (%)	Anal. Min Wt (%)	Average Wt (%)	Anal. Max Wt (%)	Total Max Wt (%)	Average Atomic	Coordination
H	0.0000	0.0000	0.0389	0.3800	0.3800	0.0854	
Li	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
C	0.0000	0.0000	0.0047	0.0710	0.0710	0.0009	
O	37.2165	37.2165	43.2950	48.9338	48.9338	6.0000	
F	0.0000	0.0000	0.0060	0.1600	0.1600	0.0007	
Na	0.0000	0.0000	0.7729	6.0609	6.0609	0.0745	8
Mg	3.6788	3.6788	7.8730	12.0018	12.0018	0.7181	6
Al	0.0000	0.0000	2.9209	9.8436	9.8436	0.2401	4 6
Si	15.8938	15.8938	22.9773	25.8976	25.9408	1.8138	4
P	0.0000	0.0000	0.0077	0.1658	0.1658	0.0006	4
S	0.0000	0.0000	0.0019	0.0700	0.0700	0.0001	4
Cl	0.0000	0.0000	0.0003	0.0100	0.0100	0.0000	
K	0.0000	0.0000	0.0454	0.4068	0.4068	0.0026	8
Ca	7.4328	7.4328	16.0885	18.8466	18.8466	0.8901	8
Ti	0.0000	0.0000	0.8910	6.3968	6.3968	0.0412	6
V	0.0000	0.0000	0.4515	11.5080	11.5080	0.0197	6
Cr	0.0000	0.0000	0.6797	11.7180	11.7180	0.0290	6
Mn	0.0000	0.0000	0.2507	5.7542	5.7542	0.0101	6

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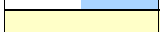
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Fe	0.0000	0.0000	3.7526	12.7180	12.7180	0.1490	6
Ni	0.0000	0.0000	0.0118	0.4401	0.4401	0.0004	6
Zn	0.0000	0.0000	0.0665	2.6592	2.6592	0.0023	6
Sr	0.0000	0.0000	0.0020	0.0670	0.0670	0.0001	8
Zr	0.0000	0.0000	0.0026	0.1021	0.1021	0.0001	6
Ba	0.0000	0.0000	0.0005	0.0190	0.0190	0.0000	8
Ce	0.0000	0.0000	0.0006	0.0200	0.0200	0.0000	8
Total			100.1420			10.0786	

Atomic proportions calculated for O = 6.0

Compilation based on 5 general and 43 sample records

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

Lustre	Vitreous
Aggregation	Granular, Massive, Columnar, Lamellar, Fibrous, Radiating
Habit	Prismatic, Anhedral, Massive
Tenacity	Brittle
Fracture	Conchoidal, Subconchoidal, Uneven
Cleavage	{110} Good, {010} Imperfect
Surface Colour	 Colourless, White, Blue, Pale Green, Green, Pale Brown
Streak	 Colourless, White
Fluor. Short	 Blue, Greenish White, Phosphoresence: Pale Orangeish Pink, , Orangeish Pink, Pinkish Orange, Pale Pinkish Orange
Fluor. Unspec	 White, Bluish White
Fluor. Long	 Cream
Other lumin.	 Cathodoluminescent: Dark Green, Bluish Red

Comp. Plan.	Comp. Surf.	Twin Plane	Twin Axis	Notes
		{100}		Simple, Multiple
		{010}		Simple, Multiple

Synonyms: chromdiopside, fassaite, ferridiopside, lavrovite, salite, schefferite

Remarks: Transparent to opaque and colourless, white, grey, blue, violet, green, to greenish black; Ti-rich varieties may be brown, to purplish brown. The streak is white to greyish white and the lustre vitreous. Diopside is brittle with an uneven fracture and the typical prismatic pyroxene cleavages. It is usually massive or granular but also infrequently occurs as short well-formed prismatic crystals. Most so-called "titanaugite" is actually titanian diopside and the green-coloured chromdiopsides are simply chromian diopside. Diopside shows complete or partial solid solution towards many other pyroxene compositions, including jadeite, aegirine, natalyite and kosmochlor.

Occurrences: In a wide range of basic and ultrabasic igneous rocks. Common in marbles and calc-silicate skarns. Also in chondritic and achondritic meteorites.

Localities of samples used in compilation: Shivas, Aberdeenshire; Glen Urquhart; Kentallan; Kilbride, Skye, Scotland. Scawt Hill, Antrim, Northern Ireland. Fabian mine, Herrang, Sweden. Outokumpu district, Karelia; Juva, Finland. Barsberg & Burgkopf, Germany. Rybnicek, Malé Kaparty Mountains, Western Carpathians, Slovakia. Val di Solda, Lombardy; Alpe della Rossa, Italy. Beni-Bouchera, Morocco. Skaergaard, East Greenland. Garividi, Andhra Pradesh, India. Myojim Island, Ehime Prefecture, Japan. Franklin, NJ; Wilmington, Delaware, U.S.A. Oka, Québec; southern Baffin Island, Nunavut, Canada. Vilyuy, Yakutia; Aeromagnitnaya & Sludyanka, Siberia; Russia. Zvare, Georgia. Murchison, Australia (meteorite).

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Diopside (var. chromediopside) in calcite



Diopside (var. chromediopside) in calcite.
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Dorian G.W. Smith

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Caption: The bright green chromian diopside seen in this image is accompanied by massive calcite which shows its rhombohedral cleavage very clearly. A little phlogopite and some titanite are also present on the specimen. Such pyroxenes are often termed "chromediopside" although they actually lie well within the compositional field of diopside according to the IMA recommended classification. For scale the 25 cent coin in the lower left is 2.4 cm in diameter. Locality: Cardiff, Haliburton County, Ontario, Canada.

Keywords: diopside; pyroxene; Ca-pyroxenes; single chain silicates; inosilicates; chromdiopside; chromediopside; granular; calcite; carbonates; Mohs' hardness 3; perfect cleavage; chromophore

Acknowledgements: From the collections of the University of Alberta (specimen no. 1081). Photography by Frank Dimitrov and Dorian Smith.

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References: Min. Mag. v.41, p.487. Amer. Min. v.69, p.465-471; v.71, p.1544; v.87, p.709-714; v.91, p. 1675-1687; v.93, p.63-73. Can. Min. v.38, p.1193-1199. J. Petrol v.28, p.867-886. Deer et al. (1963) v.2, p.42-74 & 161-166; (1978) v.2A, p.198-276 & 399-414. Park et al. (1985).