

# MinIdent-Win - chalcopyrite

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**Formula:** CuFeS<sub>2</sub>

**Status:** Mineral name is IMA approved or traditional

**Level:** Species

**Parents:** chalcopyrite-eskebornite-series

**Symmetry:** Tetragonal

**Mean Atomic Number:** 23.9

**Diffraction Values:** 3.037, 1.858, 1.589, 1.870, 1.080

**Kretz abbreviation:** Ccp

**First Described** in 1725

**Space Group:** I-42d

**Z number:** 4

**ICDD (TM) Number:** 37-471

	Minimum	Maximum	Average	Std. Dev.
a (Å)	5.240	5.293	5.266	
b (Å)	5.240	5.293	5.266	
c (Å)	10.300	10.423	10.362	
Alpha	90.000	90.000	90.000	
Beta	90.000	90.000	90.000	
Gamma	90.000	90.000	90.000	
Volume	282.813	292.009	287.366	

**C(Omega)**  Opaque  
**C(Epsilon)**  Opaque

Reflectivity	Minimum	Maximum	Average	Std. Dev.
470 nm	25.30	34.10	29.70	
546 nm	35.60	45.80	40.70	
589 nm	38.70	47.60	43.15	
650 nm	40.90	48.60	44.75	

	Minimum	Maximum	Average	Std. Dev.
Mohs	3.5	4.0	4.0	
Vickers	174	219	197	
Density	4.10	4.40	4.19	

	Total Min Wt (%)	Anal. Min Wt (%)	Average Wt (%)	Anal. Max Wt (%)	Total Max Wt (%)	Average Atomic	Coordination
S	29.9700	29.9700	34.6156	36.5000	36.5000	1.9754	4
Fe	28.9770	28.9770	30.3627	32.4000	32.4000	0.9947	4
Co	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Ni	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Cu	23.4250	23.4250	32.6415	34.3900	34.9747	0.9397	4
Zn	0.0000	0.0000	1.4440	11.1520	11.1520	0.0404	4
As	0.0000	0.0000	0.3771	2.6200	2.6200	0.0092	4
Se	0.0000	0.0000	0.5850	4.6800	4.6800	0.0136	4
Ag	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Cd	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4
Sn	0.0000	0.0000	0.4000	2.3400	2.3400	0.0062	4
Sb	0.0000	0.1200	0.1200	0.1200	0.1200	0.0018	
Te	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Hg	0.0000	0.0000	0.0163	0.1300	0.1300	0.0001	4
Pb	0.0000	0.0000	0.0078	0.0700	0.0700	0.0001	
Bi	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4
<b>Total</b>			100.5700			3.9812	



Atomic proportions calculated for S+As+Bi+Se+Te+Sb = 2.0

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Compilation based on 8 general and 10 sample records

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

<b>Lustre</b>	Metallic
<b>Aggregation</b>	Massive, Compact, Granular
<b>Habit</b>	Bisphenoidal, Tetrahedral, Granular, Equant
<b>Tenacity</b>	Brittle
<b>Fracture</b>	Uneven
<b>Cleavage</b>	{001} Imperfect, {011} Poor, {111} Poor
<b>Surface Colour</b>	 Brassy Yellow, Yellow, Golden Yellow, Brass, Iridescent
<b>Streak</b>	 Greenish Black

Comp. Plan.	Comp. Surf.	Twin Plane	Twin Axis	Notes
{101}		{101}		Contact, Polysynthetic
{301}		{301}		Contact, Polysynthetic
{100}		{100}		Penetration
{110}		{110}		Lamellar, Penetration
{111}		{111}		Contact
		{112}		Lamellar

**Remarks:** Brassy-yellow with metallic lustre and sometimes an iridescent tarnish. The streak is greenish black. The mineral is brittle with an uneven to conchoidal fracture. Sometimes it occurs as well-formed, disphenoidal (pseudotetrahedral) crystals but more commonly it is massive, compact, etc. Lamellar and polysynthetic twinning are frequently seen under the microscope in reflected light. Chalcopyrite is a widespread and important copper ore mineral and a rare constituent of meteorites, when significant and surprising quantities of sodium have been reported.

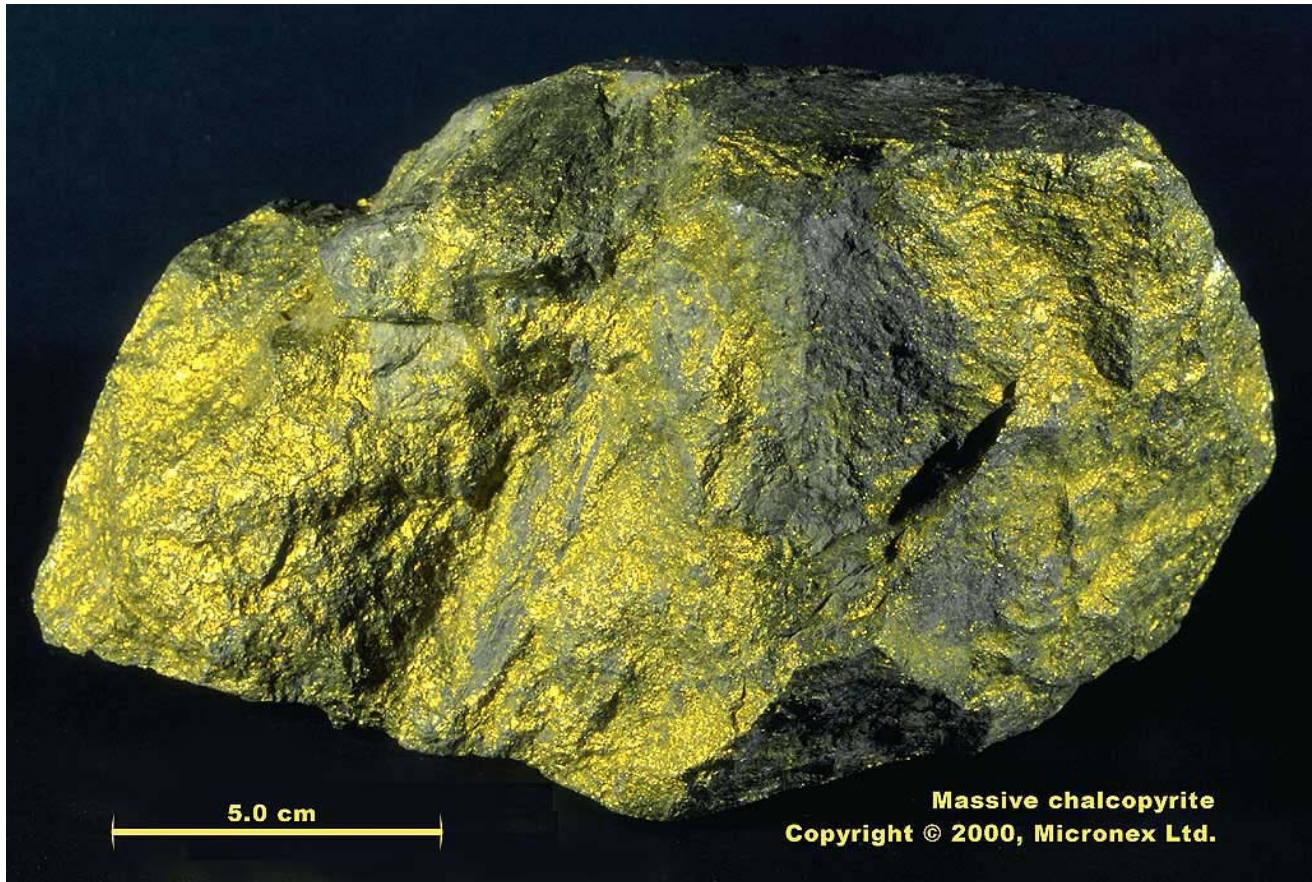
**Occurrences:** Commonly in medium to high temperature hydrothermal vein deposits, typically associated with minerals such as pyrite, sphalerite, galena, tetrahedrite, and many other sulphides and sulphosalts.

**Localities of samples used in compilation:** Erora, Portugal. Kakanga mine, Moatize, Tete, Mozambique. Ugo Province; Toyoha mine, Hokkaido; Japan. Insizwa, South Africa. 'El Teniente' ore deposit, (Branden Pipe), Chile. Niari, Zaire. Wheal Towan, St. Agnes, Cornwall, U.K. Mont St. Hilaire, Québec, Canada.

**References:** Can. Min. v.25, p.9-13. Amer. Min. v.75, p.711. Dana (7th) v.1, p.219. Deer et al. (1962) v.5, p.158. QDF for Ore Mins. B.M. (Nat. Hist.), 1986. Roberts et al. 1974. Encycl. Mins. Uytendogaardt & Burke (1971). Anthony et al. (1990).

# MinIdent-Win

## Massive chalcopyrite



*Dorian G.W. Smith*

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**Caption:** Massive, compact chalcopyrite shows the golden yellow colour and the metallic lustre that are typical of this mineral. Small amounts of other fine grained sulphides are intergrown here and there. Locality: Kidd Creek, Ontario, Canada.

**Keywords:** chalcopyrite; massive; compact; Kidd Creek; Canada; Ontario; copper ore

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