MinIdent-Win - marcasite

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Formula: FeS_2
Status: Mineral name is IMA approved or traditional
Level: Species
Parents: sulphides and marcasite-group
Symmetry: Orthorhombic
Mean Atomic Number: 20.7
Diffraction Values: 2.705, 1.760, 3.440, 1.910, 2.410

Kretz abbreviation: Mrc
First Described in 1845

Space Group: Pnnm
Z number: 2
ICDD (TM) Number: 37-475

	Minimum	Maximum	Average	Std. Dev.
a (A)	4.436	4.442	4.439	
b (A)	5.414	5.430	5.422	
c (A)	3.381	3.390	3.386	
Alpha	90.000	90.000	90.000	
Beta	90.000	90.000	90.000	
Gamma	90.000	90.000	90.000	
Volume	81.200	81.767	81.484	

C(Alpha) Opaque
C(Beta) Opaque
C(Gamma) Opaque

Reflectivity	**Minimum**	**Maximum**	**Average**	**Std. Dev.**
470 nm	43.10	51.55	*47.33*	
546 nm	48.20	56.20	*52.20*	
589 nm	45.50	55.00	*50.25*	
650 nm	44.50	53.60	*49.05*	

	Minimum	Maximum	Average	Std. Dev.
Mohs	6.0	6.5	*6.0*	
Vickers	762	1681	*1222*	
Density	4.88	5.03	4.89	

	Total Min Wt (%)	Anal. Min Wt (%)	Average Wt (%)	Anal. Max Wt (%)	Total Max Wt (%)	Average Atomic	Coordination
S	51.9700	51.9700	53.0400	53.4000	53.9812	2.0000	3 4
Fe	43.9200	43.9200	46.3343	47.2200	47.2200	1.0029	6
Co	0.0000	0.0000	0.1440	0.7900	0.7900	0.0030	6
Ni	0.0000	0.0000	0.4300	2.2400	2.2400	0.0089	6
As	0.0000	0.0000	0.1200	0.6900	0.6900	0.0019	3 4
Total			100.0683			3.0167	

Atomic proportions calculated for S = 2.0

Compilation based on 8 general and 7 sample records
Values in italics are calculated from the minimum and maximum values. Other data are from the sample and general records.

Polymorphs: pyrite

Remarks: Tin-white gradually tarnishing to brassy yellow with exposure. The lustre is metallic. Brittle with an uneven fracture and distinct {101} cleavages. It forms radiating, stalactitic, columnar or reniform masses and also flattened prismatic crystals which may have curved faces and be intergrown as "cockscomb" aggregates. Faces may show strong striations. Twinning may occur on {101} and is sometimes repeated. In

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Marcasite

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Caption: Typical "cockscomb" marcasite crystals which have a silvery yellow colour and a metallic lustre that is often affected by oxidation of the mineral specimen. The causes of the oxidation which takes place erratically and often within a period of a few years in mineral collections, still remains uncertain - although everything from humidity to sulphur-reducing bacteria have been blamed. This specimen exhibits the incipient effects of the phenomenon reflected by a dulling of the lustre in places. Ultimately the entire specimen disintegrates. Pyrite generally seems much less susceptible to oxidation by whatever process(es) is/are involved. (For scale the 10 cent, Blue Nose dime is 1.8 cm in diameter). Locality: Tri-State district, U.S.A.

Keywords: marcasite; cockscomb ore; metallic lustre; pyrite disease; Blue Nose dime; Tri-State mining district; U.S.A.; sulphides

Acknowledgements: From the personal collections of Dorian Smith. Photography by Frank Dimitrov and Dorian Smith.

reflected light, the mineral appears yellowish white, sometimes with a greenish yellow or even a pinkish tint. It is strongly bireflectant and shows marked anisotropy with blue, greenish yellow, violet-grey or purplish rotation colours. Marcasite is subject to oxidation with the formation of Fe-sulphates and, in a humid environment, sulphuric acid.

Occurrences: Marcasite forms at low temperatures and is always metastable with respect to pyrite. It occurs in clays, limestones and coal horizons as well as in hydrothermal veins as a supergene mineral.

Localities of samples used in compilation: Hugel, near Osnabruck, Germany. Koman area, northern Albania. Joplin; Jasper Co., Missouri; Galena, Cherokee County, Kansas, U.S.A. Loughborough Township, Ontario, Canada. Obara, Ibaragi Prefecture, Japan.

References: Can. Min. v.41, p.413-427. Deer et al. (1962) v.5, p.128-144. QDF for Ore Minerals, B. M. (Nat. Hist.), 1986. Dana (7th) v.1, p.311-315. Mandarino & Anderson, 1989. Uytenbogaardt & Burke (1971). Winchell & Winchell (1956) Elem. Opt. Min. Pt.II, p.49.