

# MinIdent-Win - molybdenite

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

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

**Level:** Species

**Parents:** sulphides

**Symmetry:** Hexagonal

**Mean Atomic Number:** 32.5

**Diffraction Values:** 6.110, 2.279, 1.829, 2.729, 1.530

**Kretz abbreviation:** Mol  
**First Described** in 1782

**Space Group:** P6(3)/mmc

**Z number:** 2

**ICDD (TM) Number:** 5-508

	Minimum	Maximum	Average	Std. Dev.
a (A)	3.150	3.167	3.159	
b (A)	3.150	3.167	3.159	
c (A)	12.200	12.300	12.250	
Alpha	90.000	90.000	90.000	
Beta	90.000	90.000	90.000	
Gamma	120.000	120.000	120.000	
Volume	104.836	106.840	105.836	

	Minimum	Maximum	Average	Std. Dev.
n(Omega)	4.336	4.336	4.336	
n(Epsilon)	2.035	2.035	2.035	
Max. birefringence	2.301	2.301	2.301	
Optical Sign:	-ve			

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

Reflectivity	Minimum	Maximum	Average	Std. Dev.
470 nm	21.40	53.05	37.23	
546 nm	15.50	45.17	30.34	
589 nm	18.00	44.27	31.14	
650 nm	15.00	45.65	30.33	

	Minimum	Maximum	Average	Std. Dev.
Mohs	1.0	1.5	1.0	
Vickers	8	101	55	
Density	4.62	5.06	4.84	

	Total Min Wt (%)	Anal. Min Wt (%)	Average Wt (%)	Anal. Max Wt (%)	Total Max Wt (%)	Average Atomic	Coordination
S	39.2000	39.2000	40.0125	41.1300	41.1300	2.0000	
Fe	0.0000	0.0000	0.2800	1.3100	1.3100	0.0080	
Mo	51.3100	51.3100	56.6000	58.3500	60.5394	0.9454	6
W	0.0000	0.0000	1.4925	5.8500	5.8500	0.0130	
Re	0.0000	0.0000	1.5500	3.8000	3.8000	0.0133	6
Total			99.9351			2.9798	

Atomic proportions calculated for S = 2.0

Compilation based on 7 general and 4 sample records

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

**Synonyms:** molybdenite-2h

# MinIdent-Win

Molybdenite on quartz



Molybdenite on quartz. Copyright © 2000, Micronex Ltd.

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**Caption:** An imperfect, platy, hexagonal crystal of molybdenite is seen here embedded in massive quartz which shows some iron staining. The basal cleavage can be clearly seen. The mineral most likely to be confused with molybdenite is well-crystallised graphite. Locality: Crown Point mine, Chelan County, Washington State, U.S.A.

**Keywords:** molybdenite; sulphides; molybdenum ore; metallic lustre; perfect cleavage; basal cleavage; quartz; silica; tectosilicates; silicates; Mohs' scale; hardness 7; Crown Point mine; Washington State; U.S.A.

**Acknowledgements:** From specimen no. G88.2.89, kindly made available by the Provincial Museum of Alberta, Courtesy Ron Mussieux, Curator. Photography by Frank Dimitrov and Dorian Smith.

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**Remarks:** Bluish lead-grey with a bluish grey or greenish grey streak, a metallic lustre and somewhat greasy feel. It may occur as well-formed, tabular crystals which have a hexagonal outline. More commonly it forms foliaceous masses or disseminated grains. The perfect basal cleavage gives sectile and flexible but inelastic laminae. The streak colour distinguishes the mineral from graphite. Molybdenite is the principal ore of Mo and virtually the only commercial source of Rh. Two polytypes have been recognised, the 2H for which cell and symmetry data are shown here, and also a 3R polytype (with an 18.41Å c dimension) which is probably less common.

**Occurrences:** In high temperature vein deposits, contact metamorphic deposits and disseminated in some igneous "porphyry" deposits.

**Localities of samples used in compilation:** Talmakh Copper-Nickel deposit; Noril'sk; Khibina alkaline complex, Kola Peninsula, Russia. Chateau Lambert, France. Mont St. Hilaire, Québec, Canada.

**References:** Dokl. Akad. Nauk. SSSR, v.217, p.104. Can. Min. v.7, p.524-526; v.38, p.1377-1385. Roberts et al. (1974) Encycl. Mins. QDF for Ore Mins., B.M. (Nat. Hist.), 1986. Winchell & Winchell (1956) Elem. Opt. Min. Pt.II, p.49. Uytendogaardt & Burke (1971).