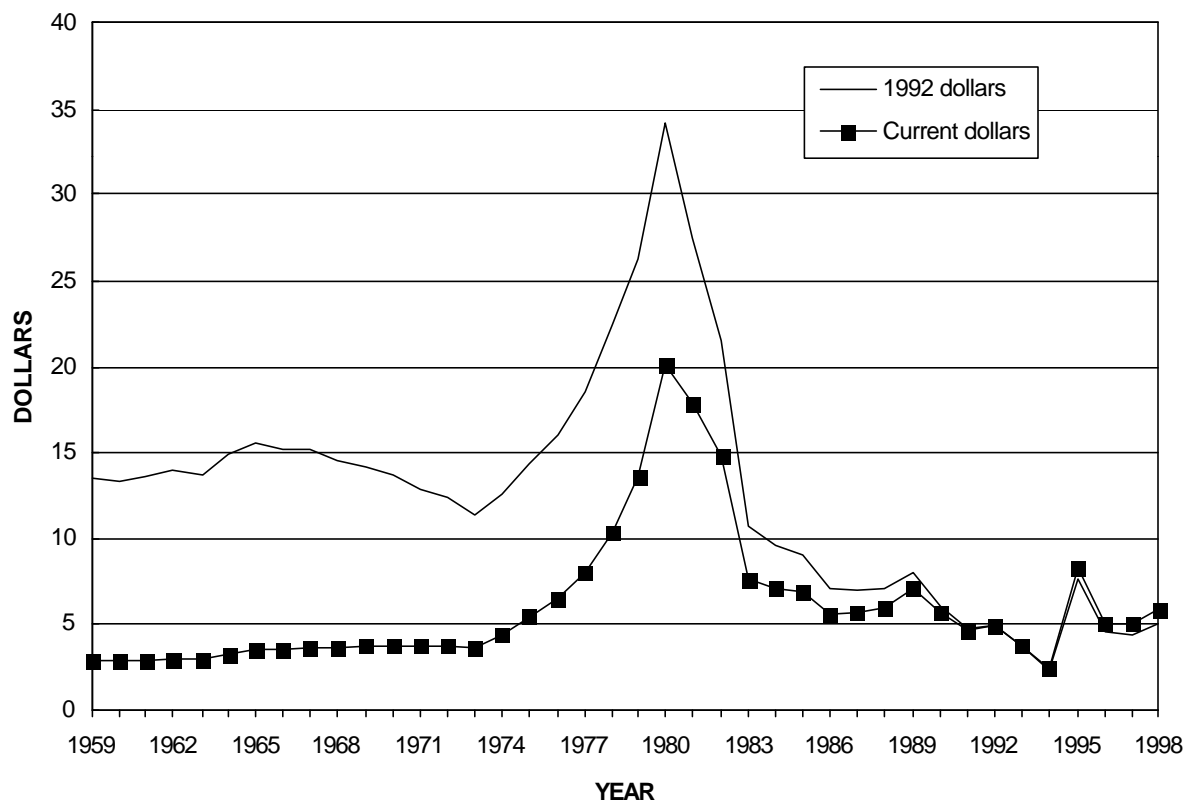


## Annual Average Molybdenum Concentrate Price (Dollars per kilogram molybdenum content)



### Significant events affecting molybdenum prices since 1958

1971-74	Price controls imposed by the U.S. Government, including metal products
1990-91	Persian Gulf War and recession
1991	Dissolution of the Soviet Union

From the period of the Greek and Roman civilizations to the late 18th century, such terms as “molybdos” or “molybdaena” were applied to minerals that were soft and “leadlike” in character; these minerals probably included those now known as galena, graphite, and molybdenite. This confusion was resolved in 1778 when the Swedish chemist, Karl Scheele, demonstrated that molybdenite, the principal molybdenum mineral, was a discrete mineral sulfide. Four years later, P.J. Hjelm of Sweden reduced the acid-forming oxide of the metal by heating it with charcoal, thereby

producing an impure powder of the metal, which he named “molybdenum.” Various properties of the element and its compounds were determined during the 19th century, and in 1893, German chemists produced a 96%-pure metal by reducing calcium molybdate. About this time, impure metal was reported to have been used experimentally as a substitute for tungsten in tool steels (Sutulov, 1965, p. 13-16).

Molybdenum-bearing armorplate was produced in France in 1894; this was the first recorded use of the metal as an alloying element in steel. Soon thereafter, Henri Mossiam, a

French chemist, succeeded in producing a 99.9%- pure metal by reduction of molybdenum in an electric furnace. Mossiam then conducted studies to establish the element's atomic weight and to determine its physical and chemical properties. These studies stimulated interest in the metal and its compounds and investigations of commercial applications. By the late 1890's, molybdenum was used in certain chemicals and dyes, and in 1898, a self-hardening molybdenum tool steel was marketed (Schneider, 1963).

Since the early 1930's, industrial research and marketing programs have considerably expanded the range of metallurgical materials in which molybdenum is a preferred or essential alloy ingredient. The use of molybdenum as a refractory metal and in a variety of chemical applications has also grown significantly (Sutulov, 1965).

The period from 1959 to 1970 resulted in steadily but only slightly increasing prices. The 1970 price of molybdenum was about 35% more than the 1959 price; the constant dollar price remained nearly unchanged. From 1971 to 1974, price controls were imposed by the U.S. Government, and between 1970 and 1980 consumers presumed a shortage would develop, but one did not materialize. The price of molybdenum did increase nearly six times from its 1970 level, while the spot price increased by eight times owing to relatively high

demand compared with that of the 1960's and early 1970's. Consumers made inquiries about purchasing, as well as actually purchasing material in excess of their needs. This action motivated the producers to develop additional unneeded mine capacity that became a major problem. The new mines came on-stream about 3 years after the peak in 1980. Prices continued to decrease through 1986 but then slowly increased for 3 years. Between 1992 and 1994, just after the Persian Gulf War, the dissolution of the former Soviet Union, and a recession, prices decreased yearly. The price in 1995 increased more than three times that of 1994, as consumers again presumed a shortage would develop; again, one did not materialize. The average price in 1996 was about 40% lower than that of 1995. As the market stabilized, prices remained about the same or increased slightly from 1996 to 1998.

### References Cited

- Schneider, V.B., 1963, Molybdenum: Ottawa, Canada, Department of Mines and Technical Surveys, Mineral Report 6, p. 1-4.  
 Sutulov, Alexander, 1965, [Molybdenum extractive metallurgy]: University of Concepcion, Chile, 239 p.

**Annual Average Molybdenum Concentrate Price**  
 (Dollars per kilogram molybdenum content)

Year	Price	Year	Price	Year	Price	Year	Price
1912	0.45	1934	1.57	1956	2.51	1978	10.40
1913	0.67	1935	1.57	1957	2.64	1979	13.60
1914	2.24	1936	1.48	1958	2.67	1980	20.10
1915	2.24	1937	1.52	1959	2.80	1981	17.80
1916	2.24	1938	1.57	1960	2.80	1982	14.80
1917	3.16	1939	1.52	1961	2.90	1983	7.60
1918	3.27	1940	1.55	1962	3.00	1984	7.10
1919	2.58	1941	1.52	1963	3.00	1985	6.90
1920	1.12	1942	1.59	1964	3.30	1986	5.60
1921	1.57	1943	1.59	1965	3.50	1987	5.70
1922	0.49	1944	1.59	1966	3.50	1988	6.00
1923	1.70	1945	1.59	1967	3.60	1989	7.10
1924	2.02	1946	1.52	1968	3.60	1990	5.70
1925	0.90	1947	1.52	1969	3.70	1991	4.60
1926	1.57	1948	1.55	1970	3.80	1992	4.90
1927	1.70	1949	1.86	1971	3.70	1993	3.80
1928	2.24	1950	1.90	1972	3.70	1994	2.50
1929	1.12	1951	2.13	1973	3.60	1995	8.30
1930	1.23	1952	2.15	1974	4.40	1996	5.00
1931	0.94	1953	2.17	1975	5.50	1997	5.00
1932	1.12	1954	2.24	1976	6.50	1998	5.80
1933	1.68	1955	2.31	1977	8.00		

Sources: Prices for the period from 1912 to 1955 were published by the U.S. Bureau of Mines, but origin is undetermined. E&MJ Metal and Mineral Markets (1956-66). Metals Week (1967-92). Platt's Metals Week (1993-98).