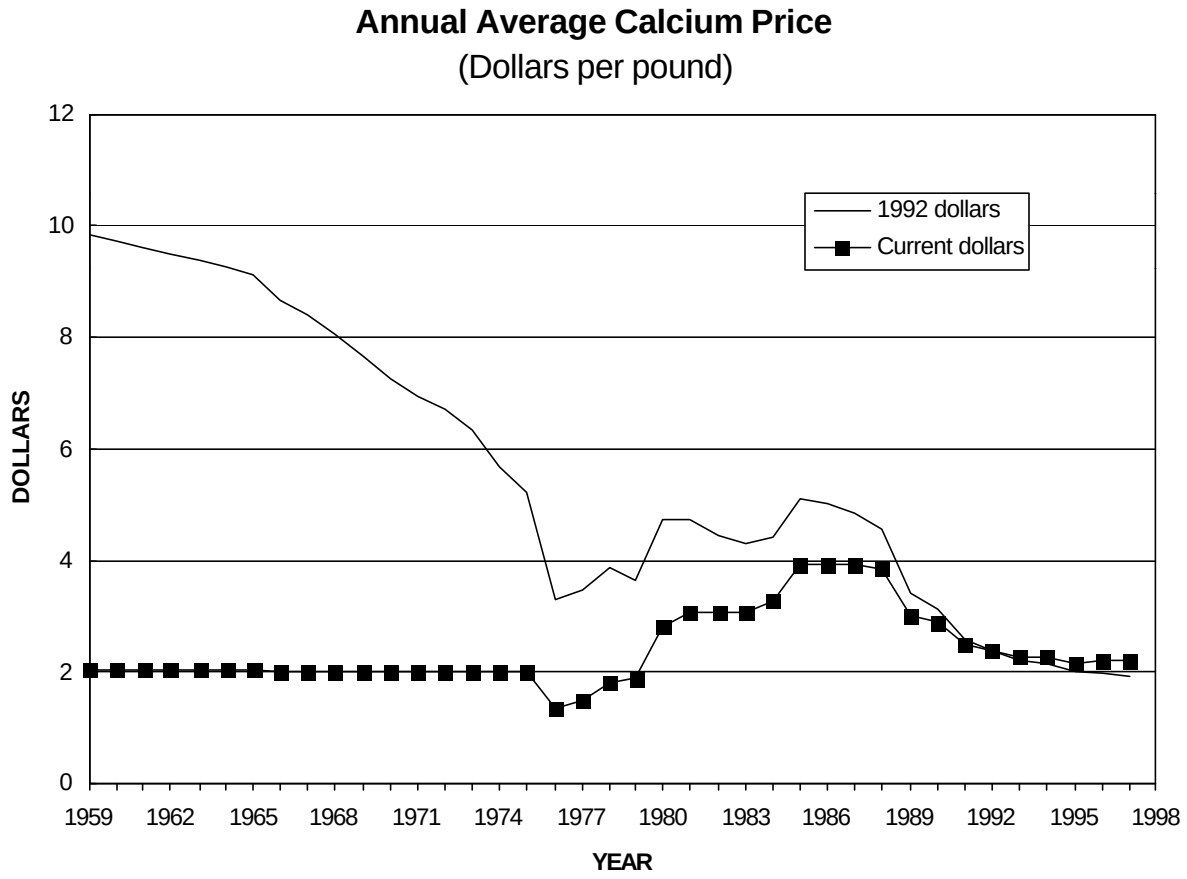
Calcium

by M. Michael Miller



Calcium is a soft, light, silvery-white metal. It is a bivalent element of the alkaline-earth group. The metal oxidizes rapidly in the presence of moisture or in dry air at a temperature above 285/ C. Calcium reacts readily with water, forming hydrated lime (calcium hydroxide) and hydrogen. It melts at 845/ C, boils at 1,420/ C, and can be purified by distillation in an inert atmosphere or in a vacuum.

Calcium metal is produced by an aluminothermic reduction process that begins with high-calcium limestone calcined to form calcium oxide. The calcium oxide is blended with finely divided aluminum, and the mixture is compacted into briquets. The briquets are placed in retorts and heated in a furnace at about 1,200/ C under high vacuum. The calcium oxide is reduced to calcium metal gas, which is collected in the water-cooled condenser section of the retort (Hibbins, 1992).

Calcium metal is sold on a contract basis, and the contract price may vary greatly from the published producer price. The published prices change infrequently and serve only as a guide to the prices obtained by producers and dealers. The prices listed in the table are quoted for different quantities (see footnotes) and cannot be directly compared.

Reference Cited

Hibbins, S.G., 1992, Calcium and calcium alloys, *in* Kirk-Othmer encyclopedia of chemical technology (4th ed.): New York, John Wiley & Sons, p. 777-786.

Annual Average Calcium Price

(Dollars per pound[1])

Year	Price	Year	Price	Year	Price	Year	Price
1959	2.05	1969	2.00	1979	1.89	1989	3.00
1960	2.05	1970	2.00	1980	2.78	1990	2.89
1961	2.05	1971	2.00	1981	3.05	1991	2.50
1962	2.05	1972	2.00	1982	3.05	1992	2.38
1963	2.05	1973	2.00	1983	3.05	1993	2.25
1964	2.05	1974	2.00	1984	3.25	1994	2.25
1965	2.05	1975	2.00	1985	3.92	1995	2.15
1966	2.00	1976	1.33	1986	3.92	1996	2.20
1967	2.00	1977	1.49	1987	3.92	1997	2.20
1968	2.00	1978	1.80	1988	3.85	1998	NA

NA Not available

[1] To convert to dollars per kilogram, multiply by 2.20462.

Note:

1959-65, metal, 97%- to 98%-pure, cast in slabs and small pieces, in more than 1-metric-ton lots, *in* Engineering & Mining Journal, Metal and Mineral Markets.

1966-75, U.S. producers price, more than 99%-pure, full crowns, in quantities of less than 100 pounds, *in* Calcium and Calcium Compounds chapters in the U.S. Bureau of Mines Minerals Yearbook.

1976-88, metal, Ca + Mg 99.5%, Mg 0.7%, full crowns, in quantities of more than 20,000 pounds, *in* Metals Week.

1989-97, metal, 98% minimum, *in* Metal Bulletin.