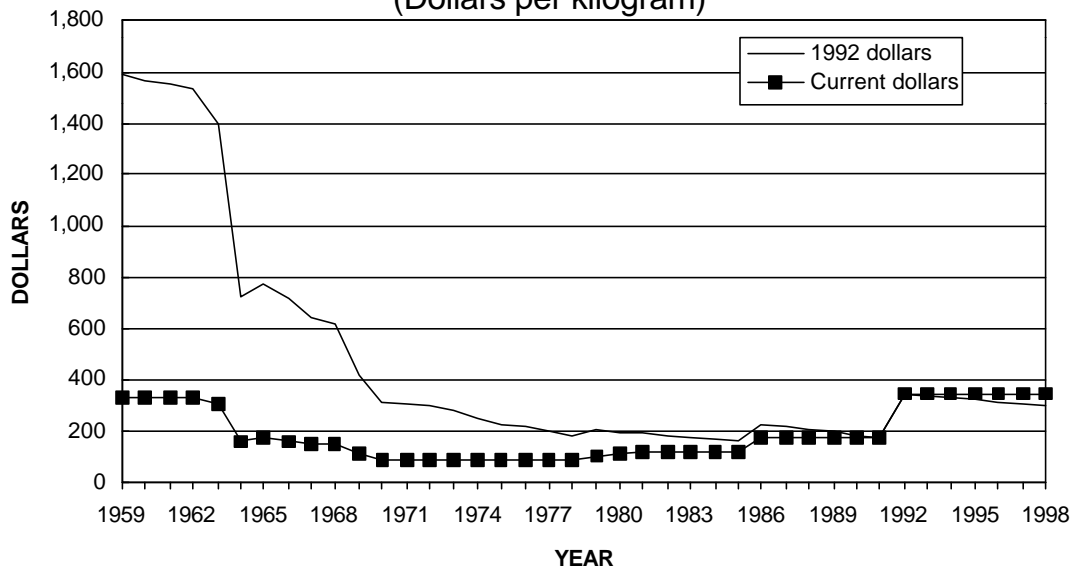
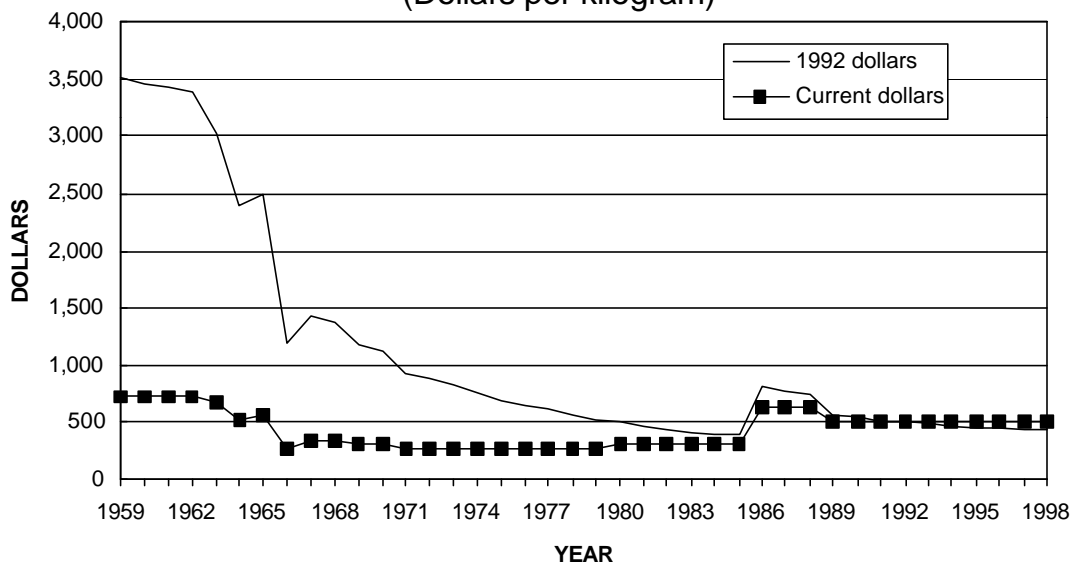


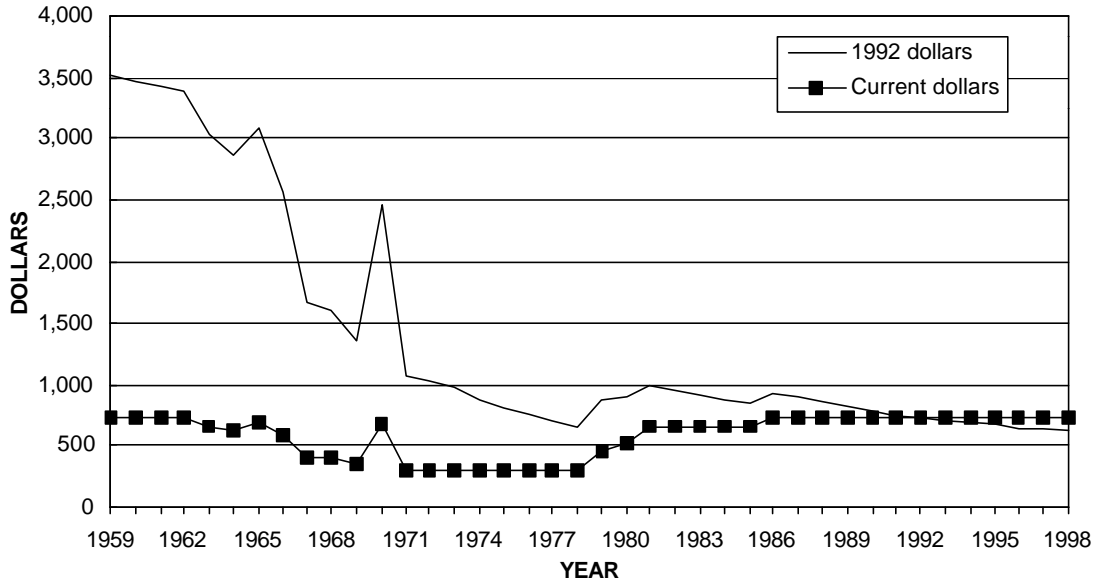
Yearend Cerium Metal Price
(Dollars per kilogram)



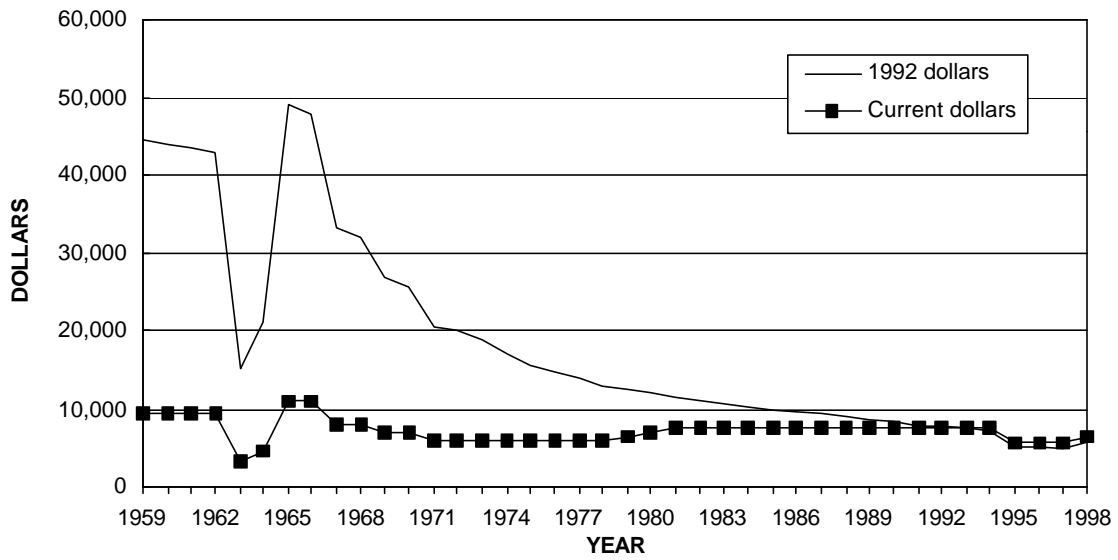
Yearend Dysprosium Metal Price
(Dollars per kilogram)



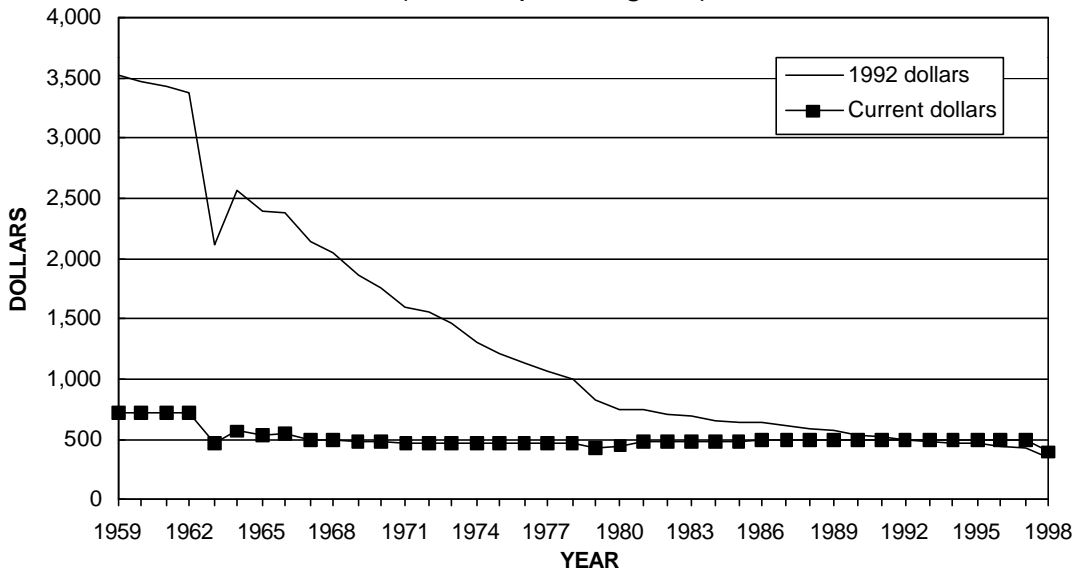
Yearend Erbium Metal Price
(Dollars per kilogram)



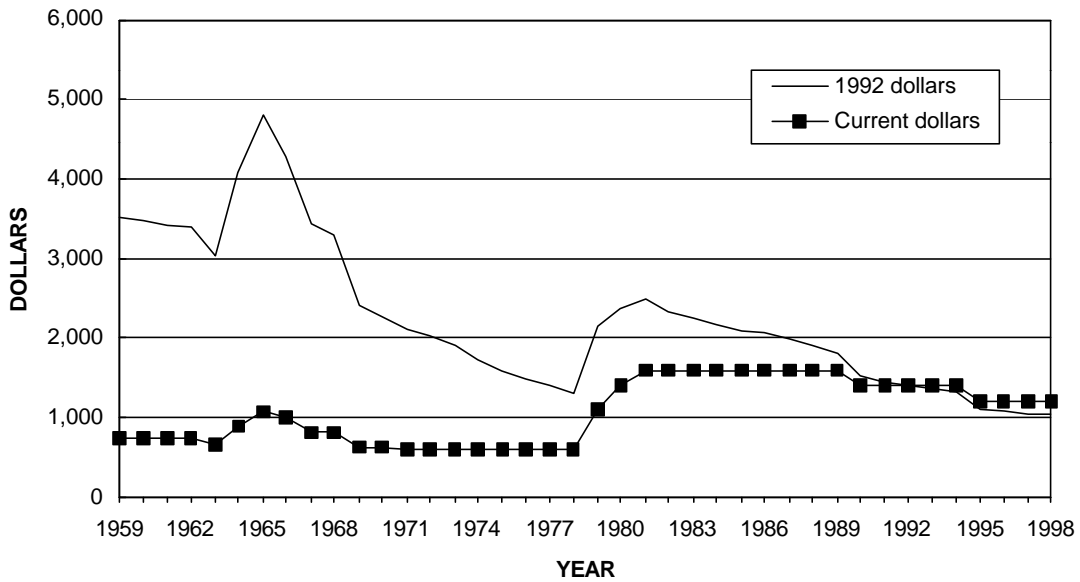
Yearend Europium Metal Price
(Dollars per kilogram)



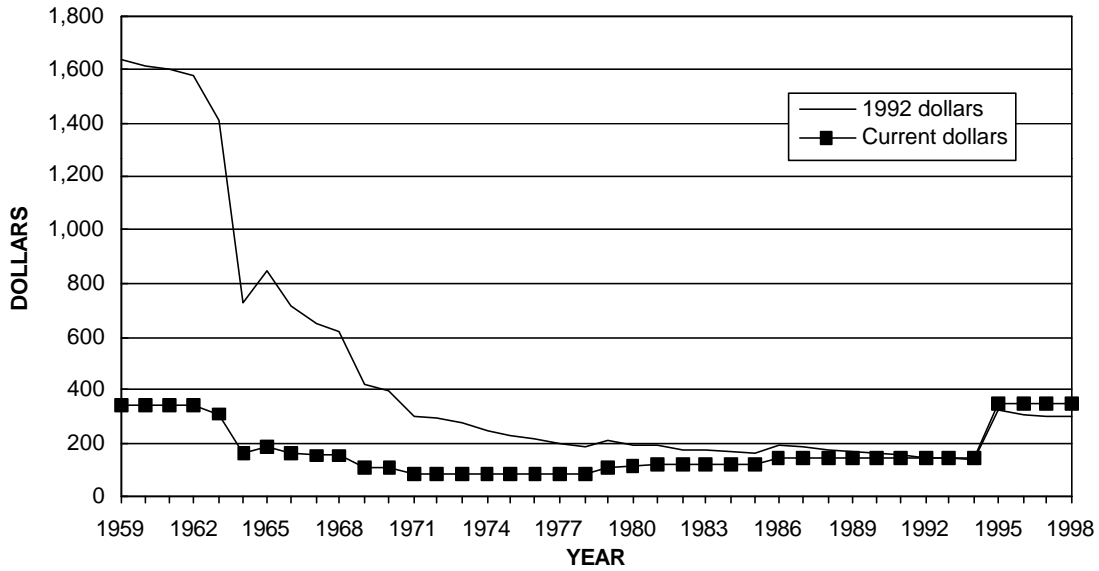
Yearend Gadolinium Metal Price
(Dollars per kilogram)



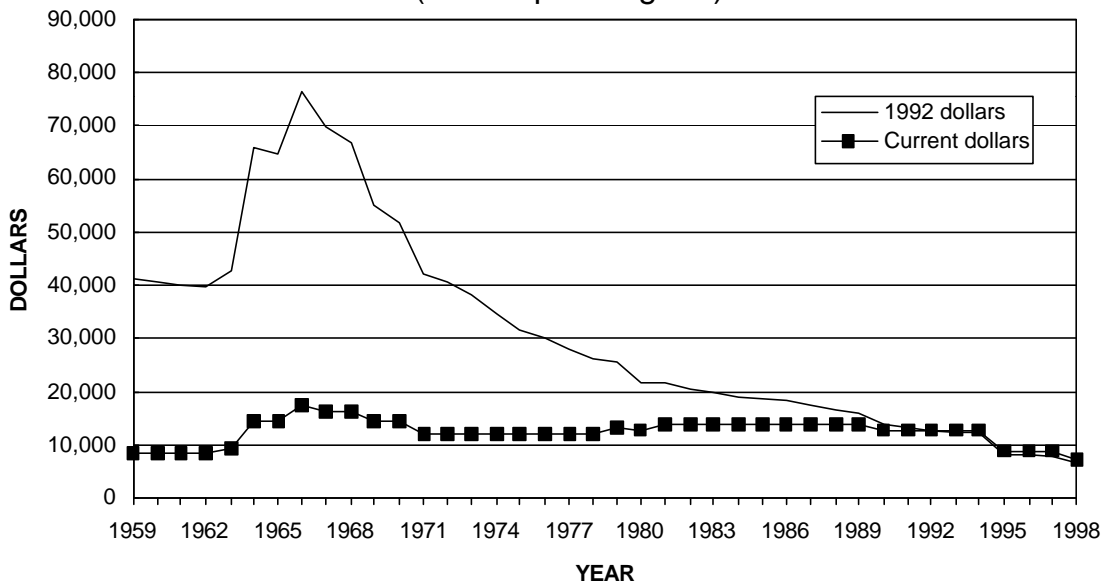
Yearend Holmium Metal Price
(Dollars per kilogram)



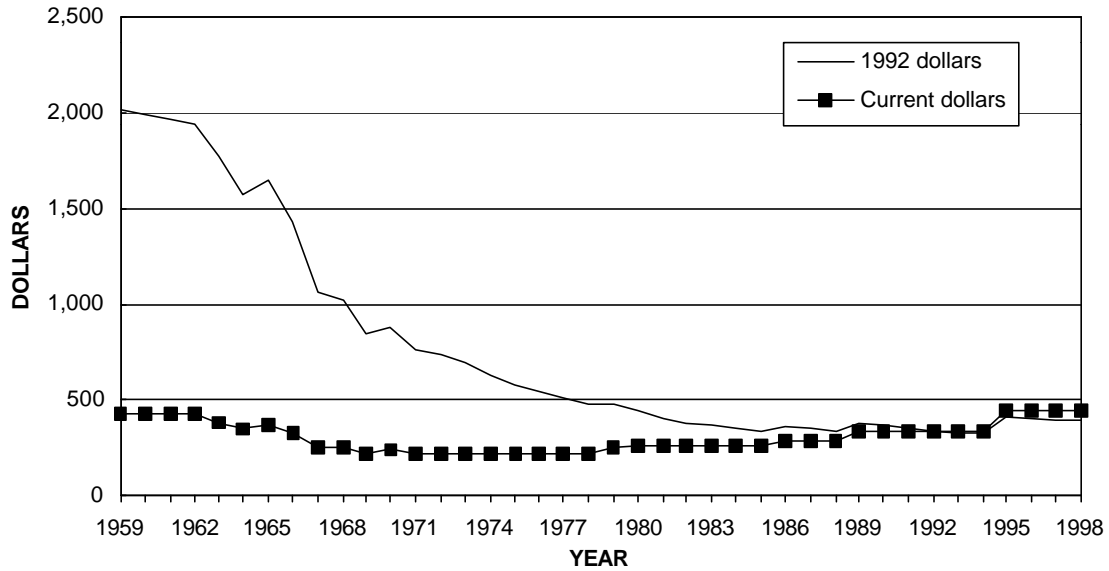
Yearend Lanthanum Metal Price
(Dollars per kilogram)



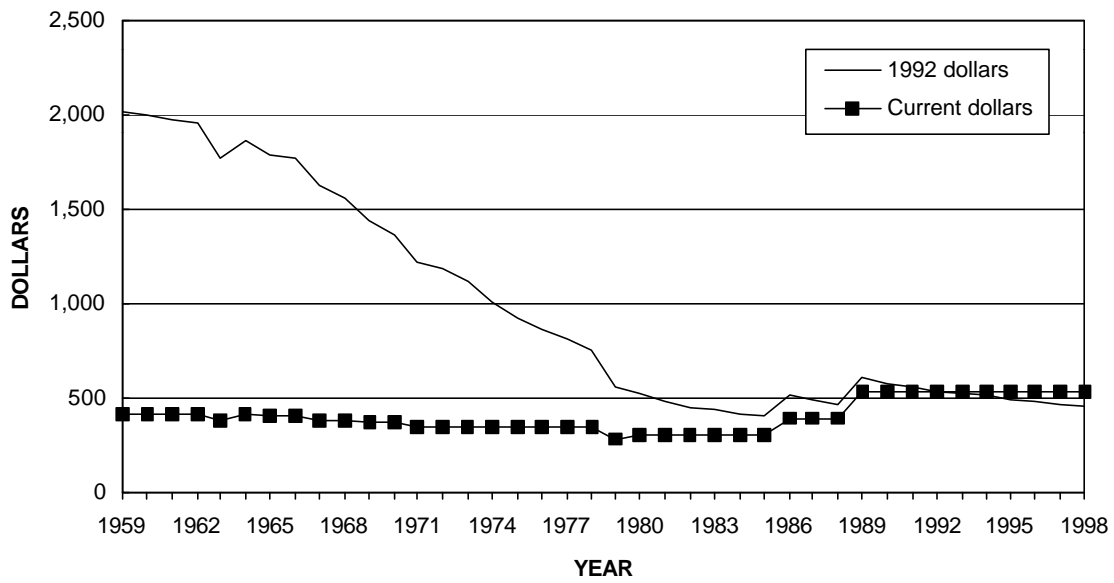
Yearend Lutetium Metal Price
(Dollars per kilogram)



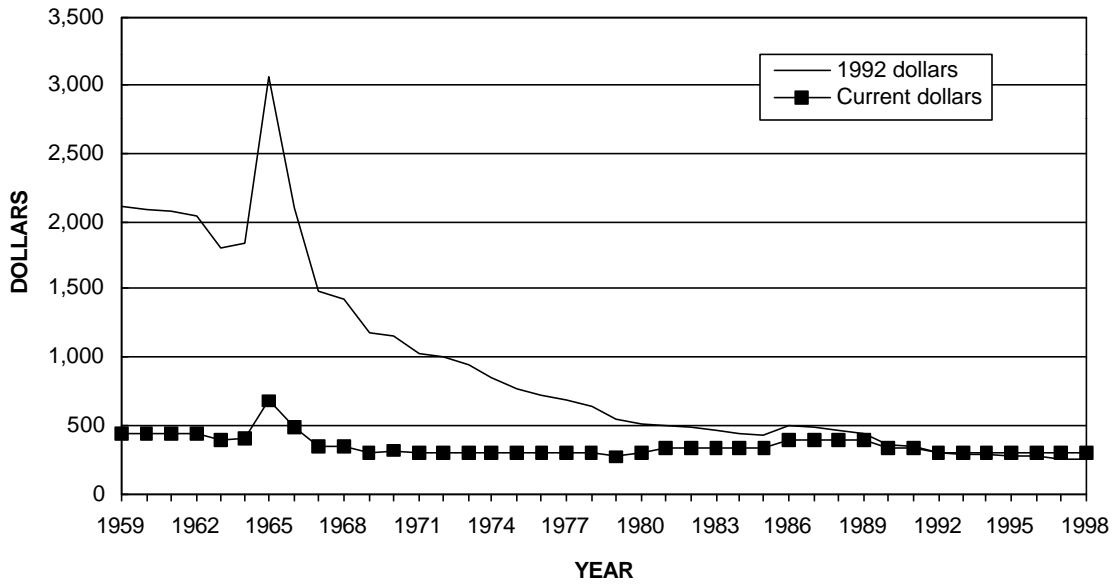
Yearend Neodymium Metal Price
(Dollars per kilogram)



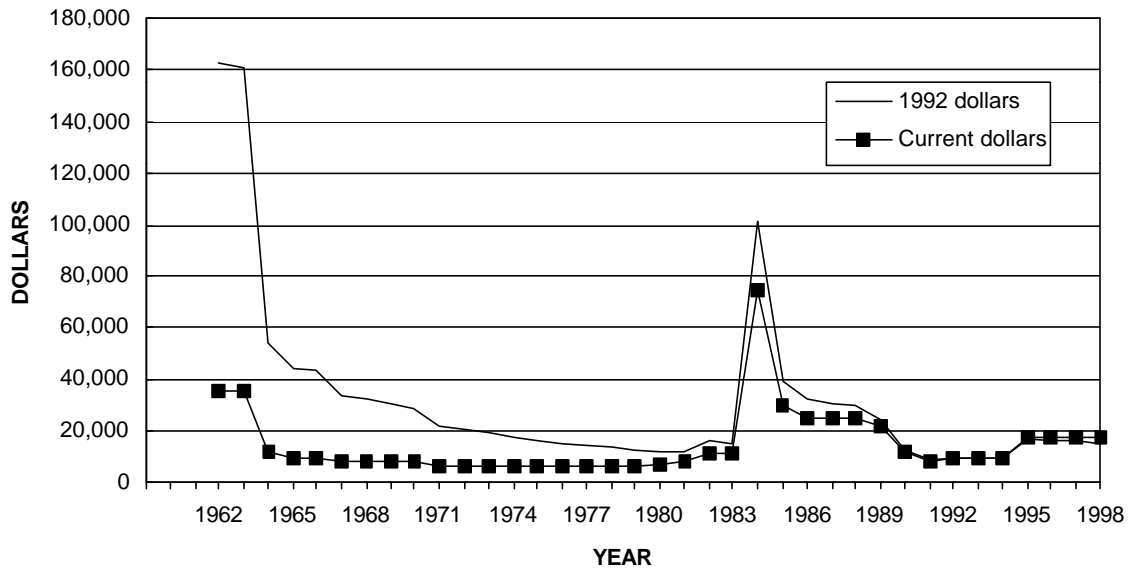
Yearend Praseodymium Metal Price
(Dollars per kilogram)



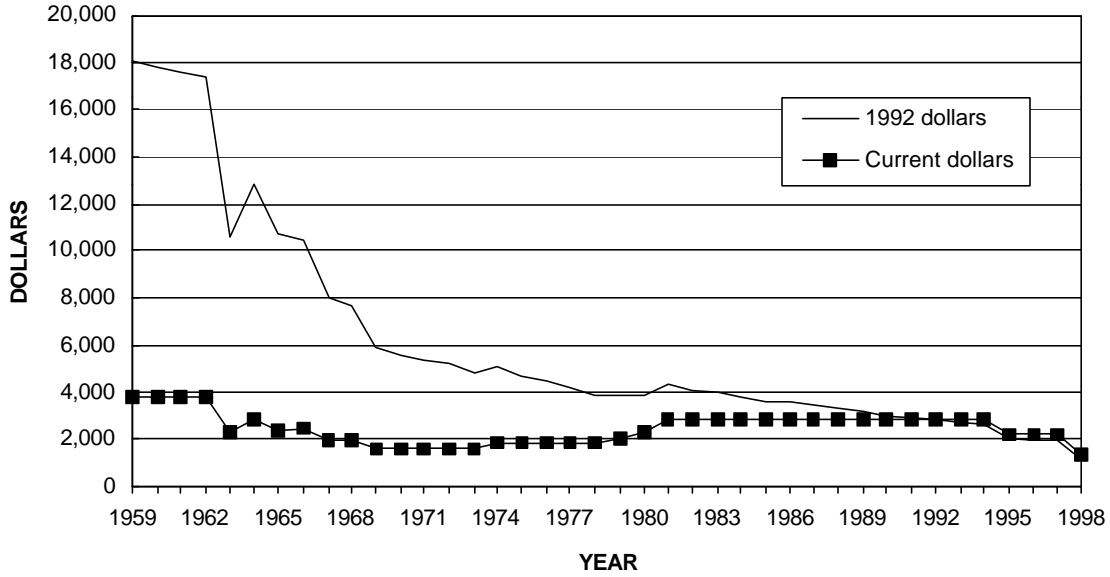
Yearend Samarium Metal Price
(Dollars per kilogram)



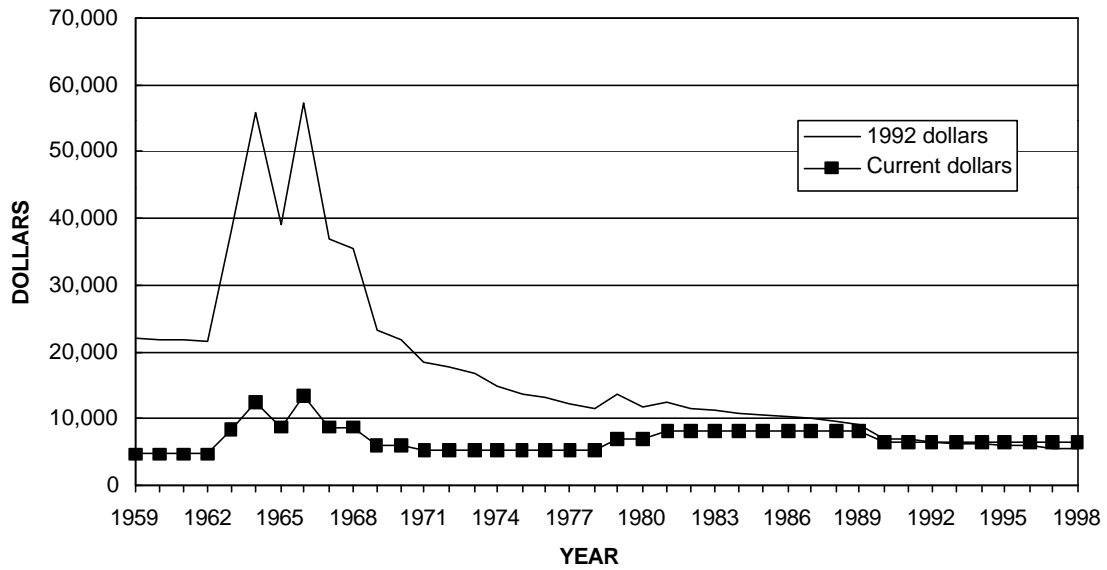
Yearend Scandium Metal Price
(Dollars per kilogram)



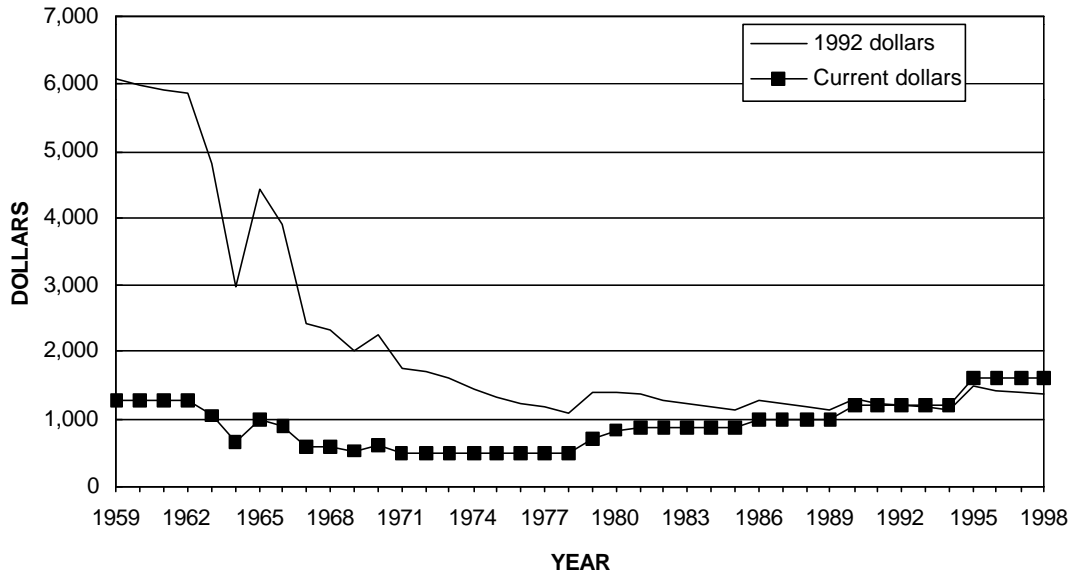
Yearend Terbium Metal Price
(Dollars per kilogram)



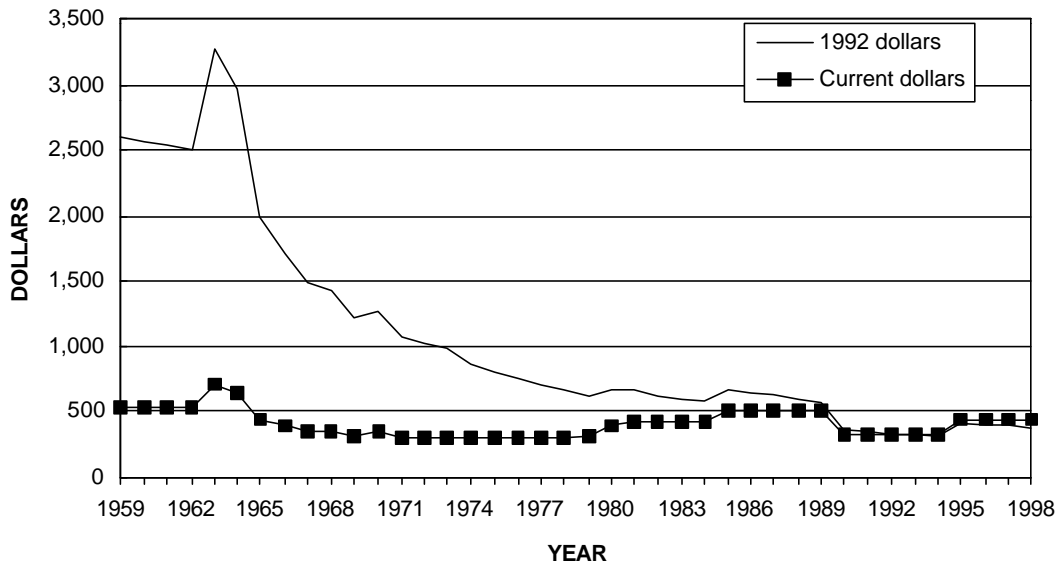
Yearend Thulium Metal Price
(Dollars per kilogram)



Yearend Ytterbium Metal Price
(Dollars per kilogram)



Yearend Yttrium Metal Price
(Dollars per kilogram)



Significant events affecting rare-earth metal prices

1958-71	Rare-earth supply increases
1971-78	Stable supply and demand
1979-81	Economic recession
1984	Scandium import supply cut
1985	U.S. environmental regulations limit lead in gasoline, reducing demand for rare-earth-containing petroleum fluid cracking catalysts
1980-90's	Increased production from China increased demand for permanent magnets, automotive catalytic converters, and rechargeable batteries

The rare earths are defined as the 17 elements comprised of scandium, yttrium, and the 15 lanthanides (Leigh, 1990). Promethium, one of the lanthanide group of elements, is radioactive. Except for very minor occurrences of this element in nature, most commercially available material is created in the laboratory. Of the 13 isotopes known to occur, promethium's half-lives are short, existing for only a few seconds to a few years. Because it is used in very small quantities and isotope price data is typically based on its radioactivity, promethium prices are not included in this report.

Prices of commercial quantities of a complete range of rare-earth metals were first quoted in the United States in the late 1950's and early 1960's. Prices decreased considerably as availability and extraction technology improved. Separation technology and metallurgical methods advanced in the years after Swedish chemist and mineralogist Carl Gustav Mosander first prepared metallic cerium in 1827 (Mosander, 1827).

Mosander prepared the first rare-earth metal by reducing cerous chloride with potassium in a hydrogen atmosphere to produce an impure powdered metal (Mosander, 1827). August Beringer in 1842, Jean-Charles G. de Marginac in 1853, and Friedrich Wöhler in 1867 used different sodium processes to reduce cerous chloride. In 1875, metallurgists were successful in producing fairly pure cerium, lanthanum, and didymium metals by electrolysis of molten rare-earth halides (Hillebrand and Norton, 1875). Subsequent work by different metallurgists contributed to electrowinning of other rare-earth metals. M. Billy and F. Trombe improved on the electrolytic method in the 1930's by producing higher-purity rare-earth metals of cerium, lanthanum, and neodymium (Billy and Trombe, 1931; Trombe, 1932, 1933). In the early 1950's, P.M.J. Gray was believed to be the first to exclude air and moisture in the electrowinning cell, using an argon atmosphere to produce cerium metal from cerium dioxide dissolved in an electrolyte (Gray, 1951-52).

Promethium metal was not prepared until 1963 when F. Weigel applied reduction of the fluoride (Weigel, 1963).

The first large-scale application of rare-earth metals began when Auer von Welsbach patented a pyrophoric alloy that

comprised 70% mischmetal (a natural mixture of metallic rare-earth elements as derived from ore) and 30% iron in 1903 (Greinacher, 1981). Five years later, the mischmetal-iron alloy was commercially marketed in an ignition system for incandescent gas lamps. The use of the lamp mantle and mischmetal-iron alloy peaked by 1912, after which electric lighting came into general use. The alloy's use continues today as the "flint" in disposable lighters, camping lanterns, and campfire starter sticks and the sparkers used to ignite laboratory and welding gases.

Rare-earth metals in pure form were first prepared in 1931 (Gschneidner, 1988). In the 1940's, some applications were found for alloying rare-earth metals with ductile iron, but significant uses were not developed until the late 1960's. The use of individual rare-earth metals remained small until the 1950's when separation and metallurgical technologies improved. Demand then increased as lower cost individual rare-earth metals became available.

Rare-earth metal prices vary considerably depending on purity and quantity. Price fluctuations in the late 1950's to 1998 were affected primarily by supply and demand, environmental legislation, and economic factors, especially inflation and energy costs.

The decline in rare-earth metal prices during the period from 1958-71 resulted from the opening of the large rare-earth deposit at Mountain Pass, California, in 1952. The period was characterized by widespread commercialization of the individual rare earths, including compounds and metals. A significant development in the late 1960's was the acceptance of rare-earth silicide, and later, mischmetal, as an additive in high-strength low-alloy (HSLA) steels.

From 1971-78, the rare-earth supply continued to grow and demand kept pace. Demand for mischmetal increased late in the period as a result of its use in steel for the Alaskan oil pipeline. Beginning in 1978, prices for the rare-earth metals were tied primarily to the U.S. economy. Double-digit inflation and higher energy costs increased operating costs throughout the mining industry. Rare-earth metal prices followed the trend and began increasing in 1979 to offset higher operating costs.

After the 1981-82 recession, as the economy improved and

inflation subsided, rare-earth metal prices stabilized, for the most part. The exception during this period was scandium. The main source of scandium at this time, the Soviet Union, ceased exports in 1984, reportedly because of internal demand for laser research. The price for scandium rose to an astronomical \$75,000 per kilogram. Scandium's price decreased markedly the following year as production in the United States came on-line (Hedrick, 1987a).

In 1985, demand for the rare earths used in petroleum fluid-cracking catalysts, their principal market, dropped sharply. The rapid decline was the result of environmental legislation reducing the amount of lead allowed in gasoline. This legislation caused the refinery industry to switch to fluid-cracking catalysts that used significantly lower amounts of rare earths. With demand down, U.S. mine production decreased by nearly 50% in 1985, resulting in a substantial increase in rare-earth metal prices the following year (Hedrick, 1987b).

Prices for rare-earth metals in the 1980's and 1990's were mixed. Growth in the rare-earth industry between 1986 and 1998 was primarily in the markets for individual high-purity products. Rare-earth metal demand in this period was greatest for neodymium metal used in high-strength neodymium-iron-boron (NIB) permanent magnet alloys. Prices for neodymium and the NIB alloying agent, dysprosium, increased in the mid-1980's as demand increased. As a result of the increased NIB magnet demand, demand and price decreased for samarium metal used in the higher cost samarium-cobalt magnets. The price of cerium metal increased in 1992 as demand increased for cerium compounds used in automotive catalytic converters. Lanthanum's price increased in the mid-1990's as demand increased for lanthanum-nickel metal hydride rechargeable batteries used primarily in cordless tools, camcorders, cellular phones, and laptop computers. The price of yttrium metal declined in 1990, as low-cost yttrium from southern China became widely available on world markets. Europium's price declined in 1995, as low-cost Chinese material pushed prices lower amid strong international competition. Prices for most other rare-earth metals stayed fairly stable or declined because of small demand and limited applications.

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Yearend Cerium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	330.00	1969	110.23	1979	108.00	1989	175.00
1960	330.00	1970	88.18	1980	115.00	1990	175.00
1961	330.00	1971	88.18	1981	125.00	1991	175.00
1962	330.00	1972	88.18	1982	125.00	1992	350.00
1963	304.24	1973	88.18	1983	125.00	1993	350.00
1964	160.94	1974	88.18	1984	125.00	1994	350.00
1965	174.17	1975	88.18	1985	125.00	1995	350.00
1966	165.35	1976	88.18	1986	175.00	1996	350.00
1967	154.32	1977	88.18	1987	175.00	1997	350.00
1968	154.32	1978	88.18	1988	175.00	1998	350.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965-66, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Dysprosium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	730.00	1969	308.65	1979	270.00	1989	500.00
1960	730.00	1970	308.65	1980	300.00	1990	500.00
1961	730.00	1971	264.55	1981	300.00	1991	500.00
1962	730.00	1972	264.55	1982	300.00	1992	500.00
1963	661.39	1973	264.55	1983	300.00	1993	500.00
1964	526.90	1974	264.55	1984	300.00	1994	500.00
1965	559.97	1975	264.00	1985	300.00	1995	500.00
1966	275.58	1976	264.55	1986	630.00	1996	500.00
1967	341.72	1977	264.55	1987	630.00	1997	500.00
1968	341.72	1978	264.55	1988	630.00	1998	500.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965, "over 1 pound" metal ingot prices, provided by Research Chemicals.
 1966, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Erbium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	730.00	1969	352.74	1979	450.00	1989	725.00
1960	730.00	1970	683.43	1980	530.00	1990	725.00
1961	730.00	1971	308.65	1981	650.00	1991	725.00
1962	730.00	1972	308.65	1982	650.00	1992	725.00
1963	661.39	1973	308.65	1983	650.00	1993	725.00
1964	632.73	1974	308.65	1984	650.00	1994	725.00
1965	694.46	1975	308.65	1985	650.00	1995	725.00
1966	595.25	1976	308.65	1986	725.00	1996	725.00
1967	396.83	1977	308.65	1987	725.00	1997	725.00
1968	396.83	1978	308.65	1988	725.00	1998	725.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965, "over 1 pound" metal ingot prices, provided by Research Chemicals.
 1966, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1-5 kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Europium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	9,250.00	1969	7,054.79	1979	6,500.00	1989	7,600.00
1960	9,250.00	1970	7,054.79	1980	7,000.00	1990	7,600.00
1961	9,250.00	1971	5,952.48	1981	7,500.00	1991	7,600.00
1962	9,250.00	1972	5,952.48	1982	7,500.00	1992	7,600.00
1963	3,306.93	1973	5,952.48	1983	7,500.00	1993	7,600.00
1964	4,645.14	1974	5,952.48	1984	7,500.00	1994	7,600.00
1965	11,023.11	1975	5,952.48	1985	7,500.00	1995	5,600.00
1966	11,023.11	1976	5,952.48	1986	7,600.00	1996	5,600.00
1967	7,936.64	1977	5,952.48	1987	7,600.00	1997	5,600.00
1968	7,936.64	1978	5,952.48	1988	7,600.00	1998	6,500.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1- to 2-pound metal ingot prices, 99.9% nominal purity, provided by Research Chemicals.
 1965-66, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Gadolinium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	730.00	1969	485.02	1979	430.00	1989	500.00
1960	730.00	1970	485.02	1980	440.00	1990	500.00
1961	730.00	1971	462.97	1981	485.00	1991	500.00
1962	730.00	1972	462.97	1982	485.00	1992	500.00
1963	462.97	1973	462.97	1983	485.00	1993	500.00
1964	568.79	1974	462.97	1984	485.00	1994	500.00
1965	537.93	1975	462.97	1985	485.00	1995	500.00
1966	551.16	1976	462.97	1986	500.00	1996	500.00
1967	507.06	1977	462.97	1987	500.00	1997	500.00
1968	507.06	1978	462.97	1988	500.00	1998	400.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965, "over 1 pound" metal ingot prices, provided by Research Chemicals.
 1966, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Holmium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	730.00	1969	628.32	1979	1,100.00	1989	1,600.00
1960	730.00	1970	628.32	1980	1,400.00	1990	1,400.00
1961	730.00	1971	606.27	1981	1,600.00	1991	1,400.00
1962	730.00	1972	606.27	1982	1,600.00	1992	1,400.00
1963	661.39	1973	606.27	1983	1,600.00	1993	1,400.00
1964	897.28	1974	606.27	1984	1,600.00	1994	1,400.00
1965	1,080.27	1975	606.27	1985	1,600.00	1995	1,200.00
1966	992.08	1976	606.27	1986	1,600.00	1996	1,200.00
1967	815.71	1977	606.27	1987	1,600.00	1997	1,200.00
1968	815.71	1978	606.27	1988	1,600.00	1998	1,200.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965, "over 1 pound" metal ingot prices, provided by Research Chemicals.
 1966, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Lanthanum Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	340.00	1969	110.23	1979	108.00	1989	150.00
1960	340.00	1970	110.23	1980	115.00	1990	150.00
1961	340.00	1971	88.18	1981	125.00	1991	150.00
1962	340.00	1972	88.18	1982	125.00	1992	150.00
1963	308.65	1973	88.18	1983	125.00	1993	150.00
1964	160.94	1974	88.18	1984	125.00	1994	150.00
1965	189.60	1975	88.18	1985	125.00	1995	350.00
1966	165.35	1976	88.18	1986	150.00	1996	350.00
1967	154.32	1977	88.18	1987	150.00	1997	350.00
1968	154.32	1978	88.18	1988	150.00	1998	350.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965-66, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Lutetium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	8,580.00	1969	14,330.05	1979	13,200.00	1989	14,200.00
1960	8,580.00	1970	14,330.05	1980	12,900.00	1990	13,000.00
1961	8,580.00	1971	12,125.42	1981	14,200.00	1991	13,000.00
1962	8,580.00	1972	12,125.42	1982	14,200.00	1992	13,000.00
1963	9,369.65	1973	12,125.42	1983	14,200.00	1993	13,000.00
1964	14,550.51	1974	12,125.42	1984	14,200.00	1994	13,000.00
1965	14,550.51	1975	12,125.42	1985	14,200.00	1995	9,000.00
1966	17,636.98	1976	12,125.42	1986	14,200.00	1996	9,000.00
1967	16,534.67	1977	12,125.42	1987	14,200.00	1997	9,000.00
1968	16,534.67	1978	12,125.42	1988	14,200.00	1998	7,500.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964-66, 1- to 2-pound metal ingot prices, provided by Research Chemicals.
 1967-73, 1- to 25-pound metal ingot prices, provided by American Potash & Chemical Corp.
 1974-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Neodymium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	420.00	1969	220.46	1979	250.00	1989	340.00
1960	420.00	1970	242.51	1980	260.00	1990	340.00
1961	420.00	1971	220.46	1981	260.00	1991	340.00
1962	420.00	1972	220.46	1982	260.00	1992	340.00
1963	385.81	1973	220.46	1983	260.00	1993	340.00
1964	348.33	1974	220.46	1984	260.00	1994	340.00
1965	370.38	1975	220.46	1985	260.00	1995	450.00
1966	330.69	1976	220.46	1986	280.00	1996	450.00
1967	253.53	1977	220.46	1987	280.00	1997	450.00
1968	253.53	1978	220.46	1988	280.00	1998	450.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965-66, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Praseodymium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	420.00	1969	374.79	1979	290.00	1989	540.00
1960	420.00	1970	374.79	1980	310.00	1990	540.00
1961	420.00	1971	352.74	1981	310.00	1991	540.00
1962	420.00	1972	352.74	1982	310.00	1992	540.00
1963	385.81	1973	352.74	1983	310.00	1993	540.00
1964	412.26	1974	352.74	1984	310.00	1994	540.00
1965	401.24	1975	352.74	1985	310.00	1995	540.00
1966	407.86	1976	352.74	1986	400.00	1996	540.00
1967	385.81	1977	352.74	1987	400.00	1997	540.00
1968	385.81	1978	352.74	1988	400.00	1998	540.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965-66, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Samarium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	440.00	1969	308.65	1979	280.00	1989	395.00
1960	440.00	1970	319.67	1980	300.00	1990	340.00
1961	440.00	1971	297.62	1981	330.00	1991	340.00
1962	440.00	1972	297.62	1982	330.00	1992	300.00
1963	396.83	1973	297.62	1983	330.00	1993	300.00
1964	407.86	1974	297.62	1984	330.00	1994	300.00
1965	687.84	1975	297.62	1985	330.00	1995	300.00
1966	485.02	1976	297.62	1986	395.00	1996	300.00
1967	352.74	1977	297.62	1987	395.00	1997	300.00
1968	352.74	1978	297.62	1988	395.00	1998	300.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965, "over 1 pound" metal ingot prices, provided by Research Chemicals.
 1966, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 2- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 2- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Scandium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	NA	1969	7,936.64	1979	6,600.00	1989	21,500.00
1960	NA	1970	7,936.64	1980	7,200.00	1990	12,000.00
1961	NA	1971	6,172.94	1981	8,000.00	1991	8,400.00
1962	35,000.00	1972	6,172.94	1982	11,000.00	1992	10,000.00
1963	35,000.00	1973	6,172.94	1983	11,000.00	1993	10,000.00
1964	11,889.53	1974	6,172.94	1984	75,000.00	1994	10,000.00
1965	10,000.00	1975	6,172.94	1985	30,000.00	1995	18,000.00
1966	10,000.00	1976	6,172.94	1986	25,000.00	1996	18,000.00
1967	7,936.64	1977	6,172.94	1987	25,000.00	1997	18,000.00
1968	7,936.64	1978	6,172.94	1988	25,000.00	1998	18,000.00

NA Not available.

Note:

1962, 1-pound metal ingot prices, 99.5+% purity, provided by Atomergic Chemetals, Div. of Gallard Schlesinger.
 1963, 100- to 400-gram metal ingot prices, 99.5+% purity, provided by Atomergic Chemetals, Div. of Gallard Schlesinger.
 1964, 1971-78, 1- to 2-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965-66, 227- to 454-gram metal ingot price, provided by Research Chemicals.
 1967-70, 1989-92, 2- to 10-pound metal ingot price, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Terbium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	3,750.00	1969	1,543.24	1979	2,000.00	1989	2,800.00
1960	3,750.00	1970	1,543.24	1980	2,300.00	1990	2,800.00
1961	3,750.00	1971	1,543.24	1981	2,800.00	1991	2,800.00
1962	3,750.00	1972	1,543.24	1982	2,800.00	1992	2,800.00
1963	2,314.85	1973	1,543.24	1983	2,800.00	1993	2,800.00
1964	2,843.96	1974	1,807.79	1984	2,800.00	1994	2,800.00
1965	2,411.86	1975	1,807.79	1985	2,800.00	1995	2,200.00
1966	2,425.08	1976	1,807.79	1986	2,800.00	1996	2,200.00
1967	1,895.98	1977	1,807.79	1987	2,800.00	1997	2,200.00
1968	1,895.98	1978	1,807.79	1988	2,800.00	1998	1,300.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1- to 2-pound metal ingot prices, 99.9% nominal purity, provided by Research Chemicals.
 1965, "over 1 pound" metal ingot prices, provided by Research Chemicals.
 1966, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Thulium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	4,620.00	1969	6,062.71	1979	7,000.00	1989	8,000.00
1960	4,620.00	1970	6,062.71	1980	6,900.00	1990	6,500.00
1961	4,620.00	1971	5,291.09	1981	8,000.00	1991	6,500.00
1962	4,620.00	1972	5,291.09	1982	8,000.00	1992	6,500.00
1963	8,377.57	1973	5,291.09	1983	8,000.00	1993	6,500.00
1964	12,387.77	1974	5,291.09	1984	8,000.00	1994	6,500.00
1965	8,818.49	1975	5,291.09	1985	8,000.00	1995	6,500.00
1966	13,227.74	1976	5,291.09	1986	8,000.00	1996	6,500.00
1967	8,818.49	1977	5,291.09	1987	8,000.00	1997	6,500.00
1968	8,818.49	1978	5,291.09	1988	8,000.00	1998	6,500.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1- to 2-pound metal ingot prices, 99.9% nominal purity, provided by Research Chemicals.
 1965-66, 1- to 25-pound metal ingot price, from 99.9%-grade oxides, provided by American Potash & Chemical Corp.
 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965-66, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Ytterbium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	1,260.00	1969	529.11	1979	720.00	1989	1,000.00
1960	1,260.00	1970	628.32	1980	825.00	1990	1,200.00
1961	1,260.00	1971	507.06	1981	875.00	1991	1,200.00
1962	1,260.00	1972	507.06	1982	875.00	1992	1,200.00
1963	1,047.20	1973	507.06	1983	875.00	1993	1,200.00
1964	654.77	1974	507.06	1984	875.00	1994	1,200.00
1965	994.28	1975	507.06	1985	875.00	1995	1,600.00
1966	903.90	1976	507.06	1986	1,000.00	1996	1,600.00
1967	573.20	1977	507.06	1987	1,000.00	1997	1,600.00
1968	573.20	1978	507.06	1988	1,000.00	1998	1,600.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965, "over 1 pound" metal ingot prices, provided by Research Chemicals.
 1966, 1- to 5- pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.

Yearend Yttrium Metal Price
(Dollars per kilogram)

Year	Price	Year	Price	Year	Price	Year	Price
1959	540.00	1969	319.67	1979	320.00	1989	510.00
1960	540.00	1970	352.74	1980	390.00	1990	340.00
1961	540.00	1971	308.65	1981	430.00	1991	340.00
1962	540.00	1972	308.65	1982	430.00	1992	340.00
1963	716.50	1973	308.65	1983	430.00	1993	340.00
1964	654.77	1974	308.65	1984	430.00	1994	340.00
1965	449.74	1975	308.65	1985	510.00	1995	450.00
1966	396.83	1976	308.65	1986	510.00	1996	450.00
1967	352.74	1977	308.65	1987	510.00	1997	450.00
1968	352.74	1978	308.65	1988	510.00	1998	450.00

Note:

1959-62, 100- to 450-gram metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1963, 1- to 4-pound metal ingot prices, 99.9% nominal purity, provided by American Potash & Chemical Corp.
 1964, 1967-78, 2- to 10-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1965-66, 1- to 5-pound metal ingot price, from 99.9%-grade oxides, provided by Research Chemicals.
 1979-88, 1-kilogram metal ingot, from 99.9%-grade oxides, provided by Research Chemicals.
 1989-94, 1-kilogram metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1995-97, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhône-Poulenc Basic Chemicals Co.
 1998, 1- to 5-kilogram cast metal ingots, from 99.9%-grade oxides, provided by Rhodia, Inc.