PLATINUM-GROUP METALS

(Platinum, palladium, rhodium, ruthenium, iridium, osmium) (Data in kilograms, unless otherwise noted)

<u>Domestic Production and Use</u>: The Stillwater Mine is the only primary platinum-group metals (PGM) producer in the United States. The mine, near Nye, MT, processed more than 820,000 metric tons of ore and recovered more than 16,000 kilograms of palladium and platinum in 2002. Small quantities of PGM were also recovered as byproducts of copper refining by two companies in Texas and Utah. Catalysts for air pollution abatement continued to be the largest demand sector for PGM. In the United States, more than 100,000 kilograms of PGM were used by the automotive industry in the manufacture of catalytic converters. Catalysts were also used in other air-pollution-abatement processes to remove organic vapors, odors, and carbon monoxide. Chemical uses include catalysts for organic synthesis, production of nitric acid, and fabrication of laboratory equipment. Platinum alloys, in cast or wrought form, are commonly used for jewelry. Platinum, palladium, and a variety of complex gold-silver-copper alloys are used as dental restorative materials.

Salient Statistics—United States:	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	2002 ^e
Mine production: ¹					
Platinum	3,240	2,920	3,110	3,610	3,900
Palladium	10,600	9,800	10,300	12,100	13,000
Imports for consumption:					
Platinum	96,700	125,000	93,700	84,200	105,000
Palladium	176,000	189,000	181,000	160,000	75,800
Rhodium	13,500	10,300	18,200	12,400	7,560
Ruthenium	8,880	11,400	20,900	8,170	10,800
Iridium	1,950	2,270	2,700	3,110	2,060
Osmium	71	23	133	77	6
Exports:					
Platinum	14,300	19,400	25,000	31,300	30,500
Palladium	36,700	43,800	57,900	37,000	41,600
Rhodium	811	114	797	982	226
Price, ² dollars per troy ounce:					
Platinum	374.61	378.94	549.30	533.29	558.75
Palladium	289.76	363.20	691.84	610.71	330.50
Rhodium	619.83	904.35	1,990.00	1,598.67	750.75
Ruthenium	47.95	40.70	129.76	130.67	60.00
Employment, mine, number	620	954	1,290	1,320	1,400
Net import reliance as a percentage of					
apparent consumption: ^e					
Platinum	94	96	78	90	93
Palladium	90	92	84	87	69

Recycling: An estimated 6,000 kilograms of PGM was recovered from new and old scrap in 2001.

Import Sources (1998-2001): Platinum: South Africa, 55%; United Kingdom, 15%; Germany, 9%; Russia, 4%; and other, 17%. Palladium: Russia, 44%; South Africa, 14%; United Kingdom, 13%; Belgium, 10%; and other, 19%.

Tariff: All unwrought and semimanufactured forms of PGM can be imported duty free.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile:

Stockpile Status—9-30-02 ³							
	Uncommitted	Committed	Authorized	Disposal plan	Disposals		
Material	inventory	inventory	for disposal	FY 2002	FY 2002		
Platinum	649		649	4,354	4,055		
Palladium	7,027	241	16,714	18,662	9,687		
Iridium	784	_	784	187	_		

PLATINUM-GROUP METALS

Events, Trends, and Issues: During the first 9 months of 2002, the average price of PGM returned to more traditional levels. Palladium's rise to more than \$1,000 per ounce during 2000 prompted the substitution of silver and base metals along with a reduction in the palladium content of its major end-use applications. Lower consumption by automobile manufacturers, a slowdown in the electronics sector, and increased production by Russia and South Africa caused palladium prices to fall to about \$450 per ounce by September 2001 and to \$330 per ounce in September 2002. Lower demand by the automobile industry and the slumping global economy caused platinum prices to fall but not nearly as precipitously as prices for palladium. Ruthenium was able to sustain its \$130 per ounce price (up from \$40 per ounce) through September 2001, but eventually fell back to \$60 per ounce in September 2002. Russia accounted for more than 45% of U.S. palladium supply and about 5% of U.S. platinum supply in 2002. Higher PGM prices in 2000-01 were followed by an increase in the pace of exploration for PGM, and a growing number of joint ventures were signed in recognition of the strong fundamentals for these metals. Exploration activities continued despite lower prices. Most producers think that developing technology, such as fuel cells, will eventually increase demand for these metals.

World Mine Production, Reserves, and Reserve Base:

	Mine production				PGM		
	Platinum		Palladium		Reserves⁴	Reserve base⁴	
	<u>2001</u>	2002 ^e	<u>2001</u>	2002 ^e			
United States	3,610	3,900	12,100	13,000	900,000	2,000,000	
Canada	5,500	7,000	8,800	11,000	310,000	390,000	
Russia	29,000	29,000	90,000	99,500	6,200,000	6,600,000	
South Africa	120,000	126,000	61,000	59,900	63,000,000	70,000,000	
Other countries	2,000	5,400	7,400	10,000	800,000	<u>850,000</u>	
World total (rounded)	160,000	171,000	179,000	193,000	71,000,000	80,000,000	

<u>World Resources</u>: World resources of PGM in mineral concentrations that can be mined economically are estimated to total more than 100 million kilograms. The largest reserves are in the Bushveld Complex in South Africa. In 2002, there were 10 producing mines in the Bushveld Complex; of these, 9 produced from the Merensky Reef and UG2 Chromite Layer and 1 produced from the Platreef, on the northern limb of the Complex.

<u>Substitutes</u>: Some motor vehicle manufacturers have substituted platinum for the more expensive palladium in catalytic converters. In addition, electronic parts manufacturers are reducing the average palladium content of the conductive pastes used to form the electrodes of multilayer ceramic capacitors by substituting base metals or silver-palladium pastes that contain significantly less palladium.

^eEstimated. — Zero.

¹Estimates from published sources.

²Handy & Harman quotations.

³See Appendix B for definitions.

⁴See Appendix C for definitions.