

Mineral Industry Surveys

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PLATINUM-GROUP METALS IN JULY 2004

The platinum price averaged \$813 per troy ounce (ounce) in July, bringing prices back to pre-December 2003 levels. Trading was between \$780 and \$834 per ounce, a more subdued trading range than in the 3 previous volatile months. The weakened U.S. dollar encouraged some speculators to buy platinum but improving economic conditions in the U.S. economy resulted in a strengthened dollar, causing the price of platinum to fall back to \$800 per ounce. The release of Anglo American Platinum Limited's (Anglo Platinum) first-half results on July 27 had no immediate effect on platinum-group metal (PGM) prices. Anglo Platinum's first-half 2004 refined platinum production was up by 27%, compared with first-half 2003 production, to 36,000 kilograms. There were no changes to the company's production and expansion schedules announced in 2003. Nevertheless, Anglo Platinum management again cautioned that continuing strength of the rand could result in delays to its expansion program and lower metal prices in the second half of 2004 (Anglo American Platinum Corporation Limited, 2004, p. 28).

Most of the primary PGMs come from low-sulfide platinum ores (South Africa) and sulfide copper-nickel ores (Canadian, Russian, and U.S. deposits). Recent exploration in Russia and elsewhere has resulted in the discovery of some new deposits of PGM-bearing low-sulfide ores. Many existing technologies for treating PGM ore are based on mechanical beneficiation, high-temperature smelting and converting operations, and hydrometallurgical processing. The development of a less complex procedure to recover PGMs and nonferrous metals

from PGM-bearing low-sulfide ores would decrease operating cost and improve environmental conditions. Now, a flowsheet has been developed for the production of rich concentrates of precious and nonferrous metals by the treatment of the flotation products from South African platinum-containing chrome ores that involves autoclave leaching, roasting, hydrochlorination, and precious metals recovery by adsorption. Autoclave oxidative leaching allows the nonferrous metals to pass into solution from which they are recovered as a rich sulfide concentrate (>30% copper and nickel). Recovering the precious metals into solution combines two operations: sinter roasting and hydrochlorination. Roasting destroys the precious metal acid-proof mineral forms. The precious metals are recovered from solution by ion exchange using anionites that are finally burned. The ash from the burning is a concentrate of precious metals (>75% in total) which are recovered in three forms: ammonium chloroplatinate with a purity greater than 98%, palladium dichlorodiamene with a purity greater than 96%, and a mixture of iridium, rhodium, and ruthenium hydrates (Platinum Metals Review, 2004).

References Cited

- Anglo American Platinum Corporation Limited, 2004, Anglo Platinum interim report: Johannesburg, South Africa, Anglo American Platinum Corporation Limited [undated], 34 p.
Platinum Metals Review, 2004, Treatment of platinum flotation products: Platinum Metals Review, v. 48, no. 3, July, p. 125-132.

TABLE 1
PLATINUM-GROUP METALS PRICES¹

(Dollars per troy ounce)

	Platinum	Palladium	Rhodium	Iridium	Ruthenium
2003:					
Low/date	605.00 April 30	151.00 April 16	NA	NA	NA
High/date	842.00 December 17	273.00 January 23	NA	NA	NA
Average	694.44	203.00	NA	NA	NA
2004:					
May:					
Low/date	771.00/10	233.00/10	810.00 ²	210.00 ²	60.00 ²
High/date	849.00/27	267.00/3 and 4	830.00 ²	210.00 ²	60.00 ²
Average	812.95	249.55	818.25	210.00	60.00
June:					
Low/date	778.00/15	219.00/14 and 15	830.00/1 and 2	210.00 ²	60.00 ²
High/date	847.00/1	256.00/1	950.00 ²	210.00 ²	60.00 ²
Average	810.59	231.32	875.00	210.00	60.00
July:					
Low/date	780.00/2	213.00/2	930.00 ²	205.00 ²	60.00 ²
High/date	834.00/20 and 21	230.00/20 and 21	1,070.00/30	210.00 ²	62.00/30
Average	813.48	222.95	974.76	206.67	60.10
Year to date:					
Low/date	771.00 May 10	200.00 January 5	500.00 January 5 and 6	87.00 February ²	41.00 January 5 and 6
High/date	940.00 April 19	340.00 April 12	1,070.00 July 30	230.00 March and April ²	72.00 March ²
Average	847.15	247.78	770.30	178.45	57.93

NA Not available.

¹Quotes from Engelhard Industries.

²Occured multiple days in month listed.

Source: Platts Metals Week.

TABLE 2
U.S. IMPORTS FOR CONSUMPTION OF PLATINUM METAL, BY COUNTRY¹

(Kilograms metal content, unless otherwise specified)

Period and country	Platinum grain and nuggets		Platinum sponge		Other unwrought platinum		Platinum, other		Platinum waste and scrap		Platinum coins	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		(thousands)		(thousands)		(thousands)		(thousands)		(thousands)		(thousands)
2003	849	\$18,600	69,700	\$1,480,000	7,210	\$143,000	4,990	\$89,700	5,670	\$37,200	16	\$426
2004:												
April	1	29	5,650	157,000	332	9,300	301	7,140	7,260	13,400	(2)	6
May	6	120 ^r	10,500	282,000	420	11,700	694 ^r	15,700	1,540	7,530	(2)	7
June:												
Belgium	--	--	137	3,540	--	--	--	--	--	--	(2) ³	2
Brazil	--	--	--	--	--	--	--	--	(2) ³	4	--	--
Canada	3	96	--	--	--	--	102	2,680	142 ³	2,500	--	--
Colombia	--	--	--	--	11	280	--	--	7	186	--	--
Dominican Republic	--	--	--	--	--	--	--	--	1 ³	23	--	--
France	--	--	--	--	--	--	--	--	60 ³	1,820	--	--
Germany	--	--	70	1,880	54 ³	1,380	264	4,900	71	1,530	--	--
Italy	--	--	130	3,450	34	876	9	232	--	--	--	--
Japan	--	--	--	--	--	--	2	40	8 ³	108	--	--
Jordan	--	--	--	--	--	--	--	--	923 ³	442	--	--
Korea, Republic of	--	--	--	--	--	--	--	--	38	1,020	--	--
Mexico	--	--	--	--	--	--	(2)	5	--	--	--	--
Netherlands	--	--	--	--	--	--	1 ³	5	--	--	--	--
Norway	--	--	30	800	--	--	--	--	--	--	--	--
Philippines	--	--	--	--	--	--	--	--	5	100	--	--
Russia	--	--	--	--	543	14,700	--	--	--	--	--	--
South Africa	--	--	5,050	129,000	--	--	19	512	--	--	--	--
Switzerland	--	--	201	5,130	6	172	--	--	--	--	--	--
United Kingdom	1 ³	9	687	17,400	1 ³	19	7	166	96 ³	2,730	--	--
Total	4	105	6,310	161,000	648	17,400	403	8,540	1,350	10,500	(2)	2
Year to date	165	4,130	40,200	1,070,000	2,130	57,300	2,310	50,800	535,000	59,400	3	59

^rRevised. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than 1/2 unit.

³All or part of these data have been referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau.

TABLE 3
U.S. IMPORTS FOR CONSUMPTION OF PLATINUM-GROUP METALS, BY COUNTRY¹

(Kilograms metal content, unless otherwise specified)

Period and country	Unwrought palladium		Palladium, other		Iridium ²		Unwrought osmium		Unwrought ruthenium		Rhodium ³	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
2003	83,500	\$518,000	21,000	\$145,000	2,200	\$6,090	53	\$430	15,900	\$16,700	12,000	\$202,000
2004:												
April	8,030	61,500	1,820	15,700	275	2,070	2	29	1,050	2,040	873	21,600
May	8,230	73,700	1,590	11,500	434 ^r	2,760	--	--	1,040	2,210	1,240	28,100
June:												
Belgium	316	2,320	--	--	--	--	--	--	--	--	79	2,070
Canada	269	2,480	--	--	--	--	--	--	--	--	--	--
Germany	19 ⁴	134	348	3,100	--	--	--	--	137	267	119 ⁴	901
Italy	2	20	114	873	--	--	--	--	--	--	--	--
Japan	336 ⁴	1,650	186 ⁴	303	--	--	--	--	--	--	--	--
Netherlands	--	--	59 ⁴	38	--	--	--	--	--	--	--	--
Norway	356 ⁴	5,920	--	--	--	--	--	--	--	--	--	--
Russia	2,330	18,300	505	3,600	--	--	--	--	21	41	22	536
South Africa	4,080 ⁴	33,300	--	--	57	318	--	--	974	1,570	431 ⁴	13,400
Switzerland	18	141	422	3,330	--	--	--	--	--	--	--	--
Taiwan	45 ⁴	100	26 ⁴	32	--	--	--	--	--	--	--	--
United Kingdom	670	4,700	5 ⁴	56	261	1,940	--	--	--	--	139 ⁴	4,140
Total	8,450	69,100	1,670	11,300	319	2,250	--	--	1,130	1,870	789	21,100
Year to date	61,500	482,000	7,930	61,000	2,270	11,700	35	106	7,860	13,100	5,780	124,000

^rRevised. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Unwrought and other forms of iridium.

³Unwrought and other forms of rhodium.

⁴All or part of these data have been referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau.

TABLE 4
U.S. EXPORTS OF PLATINUM-GROUP METALS, BY COUNTRY¹

(Kilograms of metal content, unless otherwise specified)

Period and country	Platinum ²		Platinum waste and scrap		Palladium ²		Iridium, osmium, and ruthenium ^{2,3}		Rhodium ²	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		(thousands)		(thousands)		(thousands)		(thousands)		(thousands)
2003	22,200	\$345,000	23,700	\$377,000	22,300	\$110,000	989	\$7,850	479	\$15,100
2004:										
April	2,200	34,400	2,410	47,200	2,640	19,100	145	1,260	16	515
May	2,150	29,100	2,930	53,000	3,410	17,500	25	190	16	437
June:										
Argentina	69	1,760	--	--	--	--	--	--	--	--
Australia	612 ⁴	18,000	--	--	45	191	--	--	--	--
Belgium	3	73	--	--	2 ⁴	19	--	--	--	--
Brazil	89	1,820	--	--	--	--	--	--	--	--
Cambodia	(5) ⁴	4	--	--	--	--	--	--	--	--
Canada	223 ⁴	5,580	222	2,110	652 ⁴	4,770	23	181	(5) ⁴	7
China	1 ⁴	22	--	--	83 ⁴	506	15	81	(5) ⁴	52
Colombia	1	17	--	--	--	--	--	--	--	--
Czech Republic	--	--	--	--	4	12	--	--	--	--
Denmark	(5) ⁴	6	--	--	6 ⁴	56	--	--	--	--
France	9 ⁴	122	--	--	88 ⁴	342	--	--	--	--
Germany	237 ⁴	5,340	3	103	113 ⁴	833	5 ⁴	112	--	--
Hong Kong	48 ⁴	1,050	--	--	32 ⁴	196	--	--	(5) ⁴	15
Hungary	(5)	8	--	--	--	--	--	--	--	--
India	--	--	--	--	27 ⁴	112	--	--	--	--
Ireland	9 ⁴	172	--	--	266 ⁴	624	--	--	--	--
Israel	(5)	13	--	--	62 ⁴	313	--	--	--	--
Italy	8 ⁴	85	--	--	13 ⁴	105	(5) ⁴	4	--	--
Japan	329 ⁴	7,580	142	3,520	39 ⁴	179	1 ⁴	21	--	--
Korea, Republic of	17 ⁴	428	--	--	36 ⁴	104	1 ⁴	17	(5) ⁴	23
Liechtenstein	--	--	--	--	3 ⁴	35	--	--	--	--
Lithuania	--	--	--	--	--	--	--	--	(5) ⁴	3
Malaysia	1 ⁴	15	--	--	2 ⁴	24	3 ⁴	38	--	--
Mexico	9 ⁴	138	--	--	5	31	(5) ⁴	7	(5) ⁴	14
Netherlands	3 ⁴	48	--	--	114 ⁴	454	--	--	--	--
New Zealand	1	14	--	--	8 ⁴	71	--	--	--	--
Norway	2 ⁴	37	--	--	1	13	--	--	--	--
Philippines	3 ⁴	42	--	--	--	--	--	--	--	--
Romania	1	9	--	--	--	--	--	--	--	--
Russia	1	17	--	--	--	--	--	--	--	--
Singapore	1 ⁴	24	--	--	3	21	6	32	(5) ⁴	4
Slovenia	--	--	--	--	1 ⁴	3	--	--	--	--
South Africa	10 ⁴	138	--	--	--	--	--	--	(5) ⁴	4
Spain	1 ⁴	16	--	--	8	68	--	--	--	--
Sweden	5 ⁴	69	--	--	2 ⁴	22	--	--	--	--
Switzerland	138 ⁴	1,700	95	1,600	52	461	--	--	--	--
Taiwan	59 ⁴	1,510	--	--	256 ⁴	715	--	--	--	--
Thailand	2 ⁴	31	--	--	6	52	--	--	(5) ⁴	19
United Arab Emirates	--	--	--	--	--	--	--	--	(5) ⁴	5
United Kingdom	341 ⁴	6,710	1,370	23,900	138 ⁴	669	(5)	5	--	--
Total	2,230	52,600	1,840	31,200	2,070	11,000	55	499	1	146
Year to date	10,200	180,000	15,000	287,000	18,600	87,100	796	6,590	303	6,680

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Unwrought and other forms.

³Gross weight.

⁴All or part of these data have been referred to the U.S. Census Bureau for verification.

⁵Less than 1/2 unit.

Source: U.S. Census Bureau.