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Platinum Group Metals

Introduction

In this week's blog, I am going to discuss platinum and the platinum group metals (PGM). PGM are generally considered to be platinum, palladium, rhodium, ruthenium, iridium, and osmium. These metals tend to occur together in nature and have similar physical and chemical properties.

PGM elements are rare. The Earth's upper crust contains only about 0.0005 part per million (ppm) platinum and the other PGM are even rarer. Ores that are mined for PGM typically contain 5 to 15 ppm of PGM. [1]

While PGM occur as native metals, they also occur as mineral compounds with other elements such as copper, iron, mercury, nickel, silver, bismuth, lead, and tin, antimony, arsenic, tellurium, selenium and sulfur. More than 100 minerals contain one or another PGM as an essential element. Native PGM usually occur as alloys of platinum, iron, osmium and/or iridium. [1]

PGM have many uses:

- In automobiles: pollution control catalyst, spark plugs, engine control sensors, airbag initiators, electronics for engine management systems, and fuel cells for electric vehicles
- In electronics: Connectors, Printed Circuits, Resistors, Capacitors, Lasers
- In computer hard discs, a thin layer of PGM is used to increase memory storage capacity
- In jewelry and non circulating coinage
- In glass fibre, display glass, optical glass, ceramic glass, tableware decorative patterns and finishes
- In health care for antitumor drugs, implants, treatments for heart disease, cancer screening, dental inlays, crowns and bridges
- In petrochemicals, as catalysts for production plastics, polyester, pharmaceutical ingredients, high octane gasoline, fertilizers and explosives, and silicones
- In turbine blades for aircraft engines [2]

Occurrence and Production

PGM can be found in:

- Magmatic intrusions i.e. mafic and ultramafic intrusions;
- hydrothermal deposits;
- sedimentary deposits;
- residual deposits from weathering; and

- placer deposits. 1

Figure 1 shows the worldwide distribution of magmatic PGM deposits.

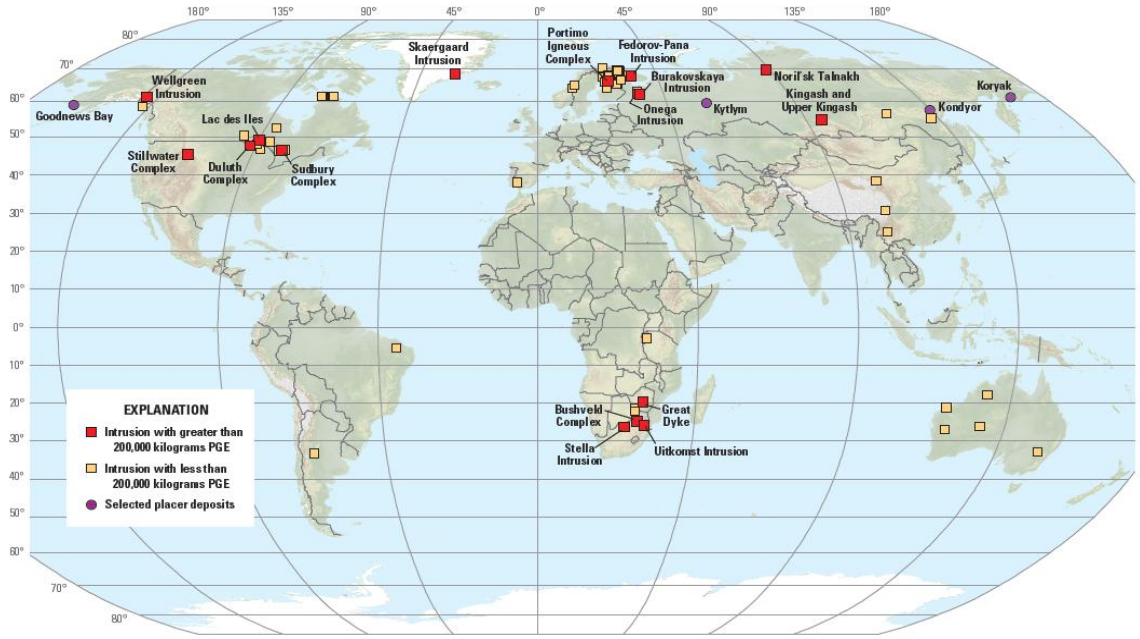

Figure 1 - PGM Intrusive Deposits [1]

World production Figures are shown on Table 1:

Annual Production - kilograms					**Reserves - kg**
	Palladium		**Platinum**		
	2018	2019	2018	2019	
South Africa	80,600	80,000	137,000	130,000	63,000,000
Russia	90,000	86,000	22,000	22,000	3,900,000
Canada	20,000	20,000	7,400	7,400	310,000
Zimbabwe	12,000	12,000	15,000	15,000	1,200,000
United States	14,300	12,000	4,160	3,600	900,000
Other countries	2,920	3,000	4,470	4,300	N/A
World Total (rounded)	**220,000**	**210,000**	**190,000**	**180,000**	**69,000,000**

Source: U.S. Geological Survey, January 2020, Mineral Commodity Summaries, Platinum Group Metals, https://pubs.usgs.gov/periodicals/mcs2020/mcs2020.pdf

Table 1 - Platinum Group Metals Production [3]

Platinum as Money

Like gold and silver, many people look to buying platinum both as an investment and a store of value. Current prices for platinum are in the order of 1,100 USD/oz. Over the past year, the prices have ranged from a low of 588 USD/oz in March 2020 to a high of 1,119 USD/oz at the end of the year. [4]

As a precious metal, platinum could be used as money, although it lacks the traditional authority of gold and silver. Mints that issue platinum coins as collector's items include those of Australia, Canada, the United Kingdom and the United States. Precious metals dealers also sell platinum bullion for investors /collectors. If this interests you, dear reader, do your own homework before you decide to invest. My only advice is: do not follow the advice of random web bloggers.

One interesting tale about platinum coins began in 1992 in the United States with a presidential candidate for the Populist Party, Bo Gritz. Mr. Gritz proposed that the American Congress should authorize the US Treasury to mint platinum coins in large denominations in order to pay off the US national debt. In May 2010, a web blogger, Warren Mosler, writing under the *nom de plume* of Beowulf, popularized the idea and the Nobel Prize winning economist Paul Krugman endorsed the idea in January 2013. [5]

The idea has generally lost favour as people realised that while it may be legal, it amounts to no more than a shift of the debt from one set of financial instruments to another set of instruments. Regardless of the financial legerdemain, the debt is still there despite the advice of random web bloggers or even a Nobel Prize winning economist .

References

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