

OUR PRODUCTS AND MARKETS

Our products – how the world uses PGMs

PGMs are the platinum group metals platinum, palladium, rhodium, ruthenium, iridium and osmium. They are particularly rare and share a set of unusual chemical properties which have made them indispensable to many critical sectors of the global economy.

These characteristics include electrical stability and conductivity, ductility, durability, resistance to corrosion, resistance to oxidation and high melting points, which allow them to remain stable and strong even in environments of extreme heat.

Here is a look at a few of the more common applications of PGMs, particularly platinum, palladium and rhodium.



Autocatalysts

Autocatalysts are small devices installed in the exhaust systems of motor vehicles, designed to chemically control the environmentally harmful emissions that are part of exhaust fumes. Autocatalysts, coated with platinum or palladium, convert over 90% of hydrocarbons, carbon monoxide and oxides of nitrogen into less harmful carbon dioxide, nitrogen and water vapour.

This forms the largest portion of overall PGM demand – almost 46% in 2010. As emissions control legislation continues to tighten in the fight against climate change, the importance of PGMs in the global automotive sector can only rise. The demand for platinum and palladium is therefore strongly tied to this pivotal industry, which was dramatically affected by the global financial crisis. 2010 saw a marked rise in vehicle production in all regions following the crisis, and corresponding rises in demand of 16% and 35% for platinum and palladium respectively.



Electronics

Because of their conductivity, durability, high temperature stability and oxidation resistance, platinum and palladium are used to build and coat many of the tiny electronic circuit components used in all types of digital devices from computers and mobile phones to specialist industrial equipment. The growing need for computers to store large amounts of information has also created a role for platinum, along with ruthenium, to improve their data storage capacity. As the world surges forward into the digital age, this is becoming an increasingly important area of PGM application. In 2010, this sector alone boosted ruthenium demand by 79%.

OUR PRODUCTS AND MARKETS cont.



Chemical and manufacturing applications

PGM-based catalysts are used in many other areas of industry and manufacturing for their chemical resistance to corrosion and high heat thresholds. Manufacturers of glass, nitric acid, silicones, petroleum and plastics all use PGMs, either to achieve the right properties in the products themselves, or to enhance the efficiency or longevity of the equipment used in the manufacturing process. Demand for platinum in this sector rocketed by 48% in 2010, driven particularly by increasing manufacturing in emerging markets.



Jewellery

In addition to its high resistance to tarnish and its attractive lustre, platinum is also one of the densest metals in nature, giving it a strength ideal for jewellery. It can be heated and cooled again and again without losing its ductility, and even the most delicate pieces retain their shape, giving designers more creative freedom than they would have using other metals.

Some rings made of platinum for example, are so strong that no fitting is required to secure the gemstones; they are held in place by the sheer tensile strength of the platinum alone.

Platinum jewellery is particularly sought after in the markets of the Far East, which accounts for more than half of global demand.



Fuel cells

Fuel cells are electrochemical cells that convert chemical energy into electrical energy, in a similar way to batteries. Unlike batteries, however, fuel cells do not need to be recharged; the flow of electricity is continuous as long as the supply of fuel is maintained. Their only emission, apart from the electricity they generate, is water, making them one of the most promising developments of green technology.

Research is currently focused on the development of fuel cell technology for use in vehicles, as fuel cell vehicles have virtually zero emissions, but the possibilities extend much further than the road. Fuel cells will also be used as power sources in homes, offices and industry as an uninterrupted supplement to electricity supplied by national grids. They can be used on a smaller scale too, in hand-held electronic devices. As the research into fuel cells accelerates, the potential applications continue to multiply.

The most common source of fuel for fuel cells is a combination of hydrogen and oxygen, reacted in the presence of a catalyst, which is usually platinum. Platinum, sometimes enhanced with small amounts of ruthenium, is the best available material to speed up the oxidation and reduction reactions involved in the chemical process. Its durability also means that it consistently outlasts other possible catalyst candidates, making it certain that platinum will remain a permanent feature of fuel cells as they are further developed and commercialised.

Investment

Like gold, platinum is considered a long-term store of value and global investment markets offer a range of platinum-backed exchange traded funds. While supply and demand were quite finely balanced in 2010, there remains a conviction among global investors that the ever increasing demand for platinum will soon outweigh its supply, limited by its natural scarcity. This dynamic seems to be primarily responsible for the growing increase in platinum investment. In 2010, over 650 000 ounces of the platinum produced went into the investment market, which exceeded the annual increase in overall platinum supply every year since 1993.