



CARRIE-ANN SMITH

PLATINUM

Element Symbol: **Pt**

Atomic Number: **78**

An initiative of IYC 2011 brought to you by the RACI



International Year of
CHEMISTRY
2011



www.raci.org.au

PLATINUM

Element symbol: Pt

Atomic number: 78

Platinum is one of the rarest, most sought after and expensive metals, being considered priceless by the ancient Egyptians and South American Incas and being proclaimed as the only metal fit for royalty by Louis XVI of France. However, its name came from being a nuisance!

The modern discovery of platinum is attributed to the Spanish Conquerors in the 17th Century. While mining in search for gold in the Choco region of Columbia, they found a metal resembling silver but it resisted melting and forging. The metal was derogatorily named platina (small silver).

Platinum is a dense, malleable, ductile metal that is remarkably resistant to corrosion, even at high temperatures. In the 18th century, it was discovered that platinum could be melted if small amounts of arsenic were added. The platinum could be beaten into sheets and drawn into very fine wire (one gram of platinum gave a thread over a mile long). By the end of the 18th century, the metal's non-reactive properties meant platinum vessels became very useful for scientific, medical and industrial purposes. After the French Revolution, the goldsmith Janety was hired to make standard weights and measures in platinum.

Platinum began its career in the jewellery industry in the 19th century with new platinum deposits being discovered in Russia. The development of furnaces, refining techniques and the invention of the oxyacetylene torch led to the increased use of platinum. After 1880, platinum was in greater demand than silver for setting diamonds. Cartier, Faberge and Tiffany have created most of their timeless designs in platinum. The world-famous diamonds including the Hope, Jonker I and the Koh-I-Noor are secured in platinum. As demand grew, the price for platinum rose until it surpassed silver and gold.

During WWII platinum was declared a strategic material and most non-military applications were prohibited. After the war, the use of platinum as a catalyst increased demand. "Platinum Black", a fine powder of platinum, catalyses the ignition of hydrogen and is used in motor vehicles as a catalytic converter which allows the complete combustion of low concentrations of unburned hydrocarbons. Other applications of platinum metals include laboratory equipment, electrical contacts and electrodes, platinum resistance thermometers and density equipment.

Platinum compounds are important chemotherapies against certain types of cancer. Cisplatin (cis-diamminedichloroplatinum(II) – trade names Platinol and Platinol-AQ) was the first member of this type of platinum-containing drugs that now includes carboplatin and oxaliplatin. The geometry of the compounds allows the reaction with DNA to occur such that it triggers apoptosis (programmed cell death). Medicinal inorganic chemistry research is undertaken by over 120 research groups throughout Australia. Australian researchers investigating the use of platinum in this area include Professor Sue Berners-Price (UWA), Associate Professor David McFadyen (UniMelb) and Professor Glenn Deacon (Monash), just to name a few.

Provided by the element sponsor Nick Broughton

ARTISTS DESCRIPTION

Platinum is the 'super metal'. It is highly resistant to corrosives, strong and malleable. I have created 'Platinum Girl', a super heroine. She is white, blonde and decorated as a Mayan princess, as the Mayans were the first main users of this metal. Platinum is termed as the 'noble' metal.

CARRIE-ANN SMITH