What do you know about platinum - Platinum, one of the most rare metals on the planet?

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Platinum (*or Platinum, white gold*) is a rare and precious metal widely used for jewelry making, catalytic converters, conductors, pacemakers, cancer medicines and magnets. It is a rare metal - only 5 parts per billion (by weight) of the earth's crust. According to Chemicool, Platinum has a very high value so everyone wants to buy platinum wedding rings.

Platinum is a white silver metal - also known as " *white gold* ". In particular, it is known as a " *noble metal* ", does not rust, is less corrosive, flexible and ductile. In addition, Platinum can be easily shaped, stretched into fibers and does not cause reactions (*ie, not oxidized and affected by normal acids*).

Platinum is one of the transition metals including *gold, silver, copper and titanium* and most of these elements are in the middle of the periodic table. The atomic structure of these metals can easily bind to other atoms.

According to Chemicool, Platinum is also one of the heaviest elements 21.45 g / cm ^{3} , 21 times lighter than the atomic mass of water and 6 times with the atomic mass of diamond. These chemical properties make platinum metals rare and expensive.

General nature:

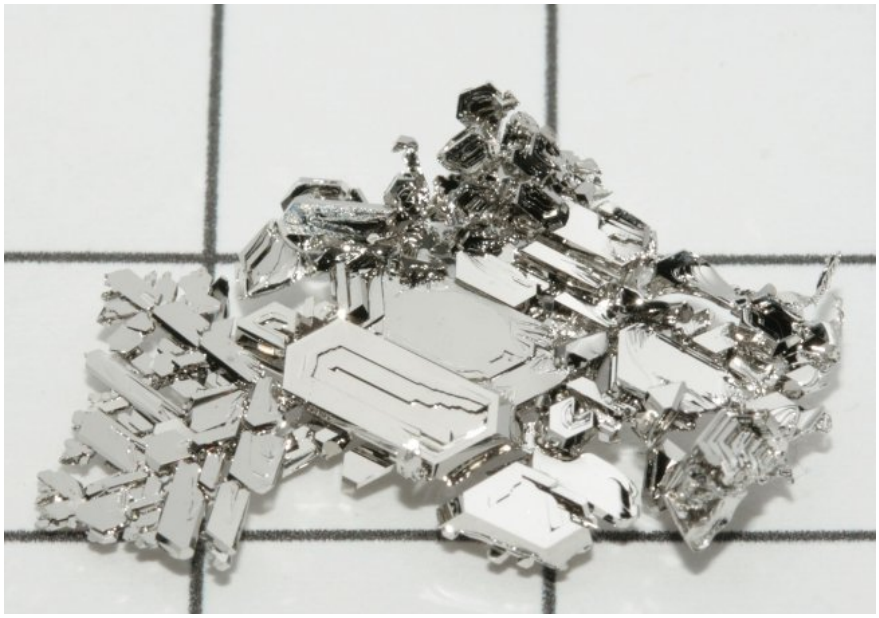
1. Number of atoms (number of protons in the nucleus): 78
2. Atomic symbol (in the periodic table of chemical elements): Pt
3. Atomic mass (average mass of atom): 195.1
4. Density: 21.45 g / cm ^{3}
5. Material state: solid
6. Melting temperature: 3215.1 ^{o} F (1768.4 ^{o} C)
7. Boiling temperature: 6917 F (3825 C)
8. Number of natural isotopes (atoms with the same element and different number of neutrons): 6. There are also 37 artificial isotopes created in the laboratory.
9. The most common isotopes: Pt-195 (33.83% natural quantity), Pt-194 (32.97% natural quantity), Pt-196 (25.24% natural quantity), Pt- 198 (7.16% natural quantity), PT 192 (0.78% natural quantity), Pt-190 (0.01% natural quantity)

Metal " *does not melt* "

In ancient times, *Egyptians* and *Americans* used platinum mixed with gold to make jewelry and decorations. The first reference to platinum was written in 1557, when Julius Scaliger - an Italian doctor described a metal found in Central America that does not melt, called *"Platina"* meaning " *have a little silver* ".

According to Dutch historian Peter van der Krogt, 1741 British scientist Charles Wood conducted a study to introduce Platinum as a new metal, with some chemical properties and commercial applications. Later, in 1748 the Spanish scientist and naval officer Antonio de Ulloa added that it was unusable and could not be melted (*In fact, he wrote it in 1735 but due to the British navy. confiscated papers*).

According to van der Krogt, before the 18th century, Platinum was the eighth metal, known as " *white gold* ". The previous metals were *iron, copper, silver, tin, gold, mercury and lead.*



In the 1800s, friends and colleagues of British chemists *William Hyde Wollaston* and *Smithson Tennant* used Wollaston's technology to produce and sell pure Platinum. This technology includes dissolving Platinum ore in a *nitric acid* mixture *(HNO3)* and *hydrochloric acid (aqua regia)* . Today, Platinum still uses the technology of Wollaston to extract. Platinum-containing specimens are dissolved in aqua regia and melt at high temperatures to produce metal.

What applications of Platinum?

1. A large cylinder of Platinum and Platinum alloy is used as an international standard to measure a kilogram. In the 1880s, about 40 cylinders weighing nearly 1 kilogram were distributed worldwide. Platinum, iridium, osmium, palladium, ruthenium and rhodium are all in the same group of metals (called " *platinum metals* ") and have similar properties. These metals often combine to create highly durable parts for many engines, tools and jewelry.
2. In 2014, *Johnstone, Park and Lippard* conducted a study and found that: " *Platinum is used in many anti-cancer drugs because of its very low reactivity* ." About 50 percent of cancer patients currently use Platinum-containing drugs. Veterinarian Barbara Forney said that *some drugs, such as cisplatin, are also used to treat tumors and cancer in animals.*
3. According to *Encyclopedia.com* , Platinum is also used in pacemakers, dentures and other devices used in the human body because it cannot be corroded from body fluids and has little reaction to body functions.
4. According to *the US Geological Survey* , the majority (approximately 80%) of Platinum is mined in South Africa, nearly 10% is mined in Russia and the rest is found in North and South America. Platinum and other platinum metals are less likely to be found in large quantities, as they are usually found only during mining of other metal mines.
5. According to *Science for Kids* , Platinum annually exploits only about 130 tons, nearly 14 times lower than the amount of gold (approximately 1800 tons).
6. According to *Total Materia* , nearly half of platinum is mined and used in catalytic converters, a part that helps cars reduce toxic emissions. Platinum and other platinum metals can withstand high temperatures in oxidation reactions to reduce emissions.

7. According to *Chemicool* , Platinum combined with cobalt creates permanent magnets. Magnets are used in medical instruments, machines, watches and more.
8. According to *Encyclopedia.com* , Platinum is used as a catalyst to increase productivity in the production of substances such as fertilizers, plastics, petroleum and other fuels.
9. Although the price of Platinum has been much changed due to the economic growth process, it has decreased significantly compared to the prices of other rare and precious metals, but many investors still use Platinum to exchange.
10. According to *Total Materia* , about 30% of Platinum is used as jewelry. Most of the most beautiful diamonds in the world, such as *Hope Diamond* (under *Famous Diamonds*) and items in the *Elizabeth Taylor* collection (according to *Bulgari*), are displayed on platters made of Platinum.

Current research on Platinum

Researchers continue to find new uses and applications of Platinum. For example: Platinum is used in anti-cancer drugs.

In 1844, Italian *chemist Michele Peyrone* accidentally discovered Platinum has anti-cancer properties (*that is, preventing the growth of tumors*). In 1971, the first cancer patient was treated with a drug containing platinum.

According to an article published in *Chemical Reviews in 2016,* about 50% of cancer patients today are treated with these rare metals. These drugs include *cisplatin, carboplatin, oxaliplatin* and others in the testing phase.

This article discusses some of the latest Platinum-containing cancer drugs and delivery systems that they believe will be more effective in fighting cancer cells. The authors call this a " *dual threat* " - a Platinum-containing drug in a supply system.

"The so-called" *bullet* "platinum in the cancer cells is responsible for preventing development and providing ways to remove cancer cells that contain many of these receptors, the researchers explained. surface. Because cancer cells divide very quickly, patients need to absorb many nutrients (such as *glucose or folic acid*). Targeted systems find different characteristics of the body and transfer drugs directly into the cell. When platinum is in cells, it will combine with other chemotherapy drugs to prevent the division of cancer cells.

One other article said: "Another benefit of using this nano-supply system is that the Platinum exists in the blood for a long time, so they can better transmit and slowly promote the effectiveness of the drug.

According to the author, due to the need for a large amount of Platinum to study anticancer drugs, the refining companies are ready to join immediately. Although the use of refined Platinum in cancer drugs is beneficial for many people, those working in platinum mines must be careful because they directly inhale and come into contact with Platinum salts (*made from the process of making clean and before being dissolved in metal)* can have the opposite effect of health risks such as allergies, body parts, or even cancer.

Several other studies, including a 2006 study published in *Water, Air, and Soil Pollution,* and a 2009 study presented at *the Canada Metallurgical Annual Meeting,* point out the connection between claims. Platinum mining and bad environmental impacts - health.