

chemical erosion as well as intense heat.

The unique properties of palladium and other platinum group metals account for their widespread use. One in four goods manufactured today either contain platinum group metals or had platinum group metals play a key role during their manufacturing process.

Palladium's precious metal qualities and appearance generate significant consumption in the luxury jewelry market.

Palladium is found in many electronics including computers, mobile phones, multi-layer ceramic capacitors, component plating, low voltage electrical contacts, and SED/OLED/LCD televisions.

### **Occurrence**

Ore deposits of palladium and other platinum group metals are rare, and the most extensive deposits have been found in the norite belt of the Bushveld Igneous Complex in the Transvaal in South Africa, the Stillwater Complex in Montana, United States, the Sudbury District of Ontario, Canada, and the Norilsk Complex in Russia. In addition to mining, recycling is also a source of palladium, mostly from scrapped catalytic converters. The numerous applications and limited supply sources of palladium result in palladium drawing considerable investment interest.

In 2005, Russia was the top producer of palladium, with at least 50% world share, followed by South Africa, U.S. and Canada, reports the British Geological Survey.

Palladium may be found as a free metal alloyed with gold and other platinum group metals in placer deposits of the Ural Mountains, Australia, Ethiopia, South and North America. It is commercially produced from nickel-copper deposits found in South Africa, Ontario, and Siberia; It takes processing of many metric tons of cores to extract just one troy ounce of palladium. However, the mine production

could still be profitable, depending on current metal prices, as other metals are produced together: nickel, copper, platinum and rhodium.

The world's largest single producer of palladium is MMC Norilsk Nickel produced from the NorilskTalnakh nickel deposits. The Merensky Reef of the Bushveld Igneous Complex of South Africa contains significant palladium in addition to other platinum group elements. The Stillwater igneous complex of Montana and the Roby zone orebody of the Lac des Iles igneous complex of Ontario also contain mineable palladium.

Palladium is also produced in nuclear fission reactors and can be extracted from spent nuclear fuel, see Synthesis of noble metals, though the quantity produced is insignificant.

Palladium is found in the rare minerals cooperite and polarite.

### **Applications**

Apart from various applications in different fields, it is widely used in the jewellery industry.

### **Jewelry**

Palladium itself has been used as a precious metal in jewelry since 1939, as an alternative to platinum or white gold. This is due to its naturally white properties, giving it no need for rhodium plating. It is slightly whiter, much lighter and about 12% harder than platinum. Similar to gold, palladium can be beaten into a thin leaf form as thin as 100 nm (1/250,000 in). Like platinum, it will develop a hazy patina over time. Unlike platinum, however, palladium may discolor at high soldering temperatures, become brittle with repeated heating and cooling, and react with strong acids.

It can also be used as a substitute for nickel when making white gold. Palladium is one of the three most popular metals used to alloy with gold, making white gold. (Nickel and silver can also be used.) Palladium-gold is a more expensive alloy than nickel-gold, but