Discovered in 1803 by William Wollaston and named after the recently discovered asteroid Pallas, palladium is a silvery-white, soft metal similar to platinum. It is a rare metal (only about 1 part per million in the earth) but occurs commonly along with copper, silver and gold.

**Properties**

Palladium is part of the Platinum Group Metals (PGM) which is located in the 5th and 6th rows of the transition metal section of the periodic table and includes Ruthenium, Rhodium, Palladium, Osmium, Iridium, and Platinum. Common characteristics include resistance to wear, oxidation, and corrosion, high melting points, and oxidation states of +2 to +4. They are generally non-toxic.

- Serves as the substitute catalysis for platinum in catalytic converters.
- The primary catalyst for liquid-phase hydrogenation.
- In the late 1960's, 60% of all palladium production is used in the telephone industry in the form of cross-over contacts in telephone lines. Since the shift to a fully-electronic system, palladium use has declined.
- With the possible dawn of an alternate technology in motorized vehicles, palladium has garnered a lot of attention as a possible player in fuel cell technology.
- As the price and scarcity of platinum increases, palladium has become more marketable as the primary catalyst in combustion engines.

Palladium is used as an alloying agent with gold in jewelry ("white gold") and in some dental applications in place of silver or gold. Unlike the other so-called platinum metals, palladium is more susceptible to attack by acids, even hydrochloric acid.

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\ce{Pd_{(s)} + 2HCl \rightarrow Pd^{2+} + H_{2(g)} + 2Cl_{(aq)}^-}
\]

"Cold Fusion"

Palladium has the curious ability to absorb large quantities of hydrogen gas (up to 900 times its own volume) and this has generated some interest in its alloys as a storage system for hydrogen as a portable fuel for automobiles. It was also prominent in the "cold fusion" controversy some years ago when it was said (apparently falsely) that when it was made to absorb heavy hydrogen (deuterium), the atoms would undergo fusion and release more energy than was put into the process.

**Contributors**

- Stephen R. Marsden (ChemTopics)
- Template:ContribChem230