Palladium Encyclopedia Article

Palladium

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Palladium

Palladium is a metal element denoted by the atomic symbol Pd. It has an atomic number of 46 and an average atomic weight of 106.42. It is a steel-white metal that is found associated with nickel & copper deposits.

Palladium, a member of the platinum metal group, was discovered by William Hyde Wollaston in 1803. In his attempts to refine platinum into a workable form, he dissolved crude ore in a solution of nitric acid and hydrochloric acid. When treated with iron, ammonium chloride, and additional nitric acid, a curious red solution formed. Wollaston added mercury to form an amalgam, which he then decomposed with heat. The result was a white metal, which he named Palladium after the recently discovered asteroid, Pallas. The discovery was announced anonymously, causing many to believe it was a fraud; and the metal merely an alloy of platinum and mercury.

Palladium has the lowest melting point (2,830.8°F/1,554.9°C) of all the platinum metals, and is quite soft, allowing it to be beaten into leaf as thin as 1/250,000 inch. It does not tarnish in air, making it useful in the jewelry industry. White gold is an alloy of yellow gold decolorized by the addition of palladium. It is also used in watchmaking, dentistry, and in the manufacture of surgical instruments. Additionally, it is a good catalyst for hydrogenation reactions.

At room temperature, palladium has the curious ability to absorb up to 900 times its own volume in hydrogen. Whether this association forms a true compound of Pd_2H is unknown, however, the hydrogen diffuses readily when the palladium is heated, providing a good means of purifying the gas.