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Under standard conditions, tungsten is a hard metal. Tungsten is also known as wolfram and has the atomic number 74 and the symbol of W on the periodic table. It is a chemical element. On earth, tungsten is only found within chemical compounds. The important ores of tungsten are scheelite and wolframite. As a free element it has a remarkable robustness and has the highest melting point out of any of the non alloyed metals. It has the second highest melting point out of all the elements falling behind only carbon.

History

Carl Wilhelm Scheele, in 1781, along with Torbern Bergman found that tungstic acid could be formed from scheelite and decided it may be possible to form a new type of metal if the acid were to be reduced. Two years later, Fausto and Jose Elhuyar found an identical acid that was made from wolframite. Later in 1783, the brothers were able to isolate the metal tungsten by reducing the acid using charcoal. The two Spanish brothers are credited with discovering the element tungsten.

The name tungsten means â€œheavy stoneâ€• in Nordic. This is the name of the element in French, English, and several other languages as well. The mineral scheelite was called tungsten in Swedish. Wolfram or â€œvolframâ€• is the other name for the element. This name is used in many European countries such as Slavic and Germanic languages. It comes from the mineral known as wolframite, which is why the chemical symbol for tungsten is a W.

Physical and Chemical Properties

In the raw form, tungsten is hard and a steel gray in color. It is typically very brittle and difficult to work. However, if tungsten is made extremely pure it can become malleable enough to work with easily. It can be worked using drawing, forging, sintering, and extruding techniques.

In pure form, tungsten has a higher melting point than any of the other metals in pure form. It also has the lowest vapor pressure as well as the most tensile strength.

The element tungsten is resistant to attacks by acids, alkalis, and oxygen. +6 is the most common oxidation state of the element.

Uses for Tungsten

The main use for tungsten is for making hard materials that are based with tungsten carbide. It is uses for making cutters and knives used in drills, circular saws, and for milling and turning tools that are used for working with metal and wood. It is also used in the mining, construction, and petroleum industries which accounts for approximately 60% of the consumption of the element.

Additionally, tungsten is used within the jewelry industry to make sintered tungsten carbide rings, metal composites/tungsten carbide, and as a simple metallic. Often tungsten is referred to by retailers and manufacturers as a metal. However, tungsten carbide is actually ceramic.

Because tungsten is so hard and dense, it is often used to produce heavy metal alloys. High speed steel is a good example of the use of a tungsten alloy. It may contain up to 18% of the element.

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