The name for the metal tungsten is taken from the Swedish, tungsten, for "heavy stone". The symbol has its origins in the discovery of the element in the late 1700's linked to the mineral wolframite. Most German chemists still refer to the element as Wolfram (wolf's metal). Pure tungsten was eventually isolated in 1783 by brothers Juan and Fausto Elhuyar.

Tungsten is known chiefly as the metal in incandescent light bulb filaments (tungsten has the highest melting point of any metal). But a lot of tungsten is also used in the manufacture of tungsten carbide, an extremely hard material used for making cutting tools and abrasives. The metal is also alloyed with steel for very high temperature applications such as rocket engine nozzles.

Very pure tungsten is actually soft enough to be cut with an ordinary hacksaw but generally small amounts of impurities render the metal very hard and brittle. It is very similar to both Mo and Cr. It is straddled by elements having the second and third highest melting points, rhenium, Re, and tantalum, Ta.

This page deals with the extraction of tungsten from tungsten(VI) oxide, WO$_3$, produced from tungsten ores such as wolframite or scheelite.

**The Extraction Process**

Pure metallic tungsten cannot be obtained by reducing tungsten(VI) oxide using carbon, because it reacts with carbon to make tungsten carbide. Instead, the reducing agent is hydrogen. Powdered tungsten(VI) oxide is heated to temperatures in the range 550 - 850°C in a stream of hydrogen.

$$WO_3 + 3H_2 \rightarrow W + 3H_2O$$

An excess of hydrogen is used, and this carries away the steam produced during the reaction. The hydrogen is dried and recycled. Great care obviously has to be taken to keep the whole system free of air to avoid explosion risks with the hydrogen at these high temperatures.

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