*** Name Origin:**

Swedish: tung sten (heavy stone): W symbol from its German name wolfram.

*** Sources:**

Occurs in the minerals scheelite ($CaWO_4$) and wolframite [$(Fe,Mn)WO_4$].

*** Uses:**

Used widely in the electronics industry. Made into filaments for vacuum tubes and electric lights. Also used in contact points in cars, welding electrodes, rocket nozzles and cutting tools. Combined with calcium or magnesium it makes phosphors.

*** Additional Notes:**

In 1779 Peter Woulfe examined the mineral now known as wolframite and concluded it must contain a new substance. Scheele, in 1781, found that a new acid could be made from tung sten (a name first applied about 1758 to a mineral now known as scheelite). Scheele and Berman suggested the possibility of obtaining a new metal by reducing this acid. The de Elhuyar brothers found an acid in wolframite in 1783 that was identical to the acid of tungsten(tungstic acid) of Scheele, and in that year they succeeded in obtaining the element by reduction of this acid with charcoal. Tungsten occurs in wolframite, $(Fe, Mn)WO_4$; scheelite, $CaWO_4$; huebnerite, $MnWO_4$; and ferberite, $FeWO_4$. Important deposits of tungsten occur in California, Colorado, South Korea, Bolivia, Russia, and Portugal. China is reported to have about 75% of the world's tungsten resources. Natural tungsten contains five stable isotopes. Thirty two other unstable isotopes and isomers are recognized. The metal is obtained commercially by reducing tungsten oxide with hydrogen or carbon. Pure tungsten is a steel-gray to tin-white metal. Very pure tungsten can be cut with a hacksaw, and can be forged, spun, drawn, and extruded. The impure metal is brittle and can be worked only with difficulty. Tungsten has the highest melting point of all metals, and at temperatures over 1650° C has the highest tensile strength. The metal oxidizes in air and must be protected at elevated temperatures. It has excellent corrosion resistance and is attacked only slightly by most mineral acids. The thermal expansion is about the same as borosilicate glass, which makes the metal useful for glass-to-metal seals. Tungsten and its alloys are used extensively for filaments for electric lamps, electron and television tubes, and for metal evaporation work; for electrical contact points for automobile distributors; X-ray targets; windings and heating elements for electrical furnaces; and for numerous spacecraft and high-temperature applications. High-speed tool steels, Hastelloy®, Stellite®, and many other alloys contain tungsten. Tungsten carbide is of great importance to the metal-working, mining, and petroleum industries.Calcium and magnesium tungstates are widely used in fluorescent lighting; other salts of tungsten are used in the chemical and tanning industries. Tungsten disulfide is a dry, high-temperature lubricant, stable to 500° C. Tungsten bronzes and other tungsten compounds are used in paints. Some sources give the German chemist Karl Wilhelm Scheele as the first to isolate the metal, three years before the d'Elhuyar brothers, in 1780.