*** Name Origin:**

From the Latin word 'carbo' which means charcoal.

*** Sources:**

Made by burning organic compounds with insufficient oxygen.

*** Uses:**

As carbon's major properties very widely depending upon its form, carbon's uses also very greatly. Carbon-14 which is radioactive is used in "carbon dating" (telling how old something is by determining the amount of Carbon-14 present in the item being tested as compared to a standard value for a similar object which is new). Other uses include pencils, diamonds, steel, controls nuclear reactions, tire colorant, plastics, paint pigments, lubricants and much more.

*** Additional Notes:**

Carbon, an element of prehistoric discovery, is very widely distributed in nature. It is found in abundance in the sun, stars, comets, and atmospheres of most planets. Carbon in the form of microscopic diamonds is found in some meteorites. Natural diamonds are found in kimberlite of ancient volcanic “pipes,” such as found in South Africa, Arkansas, and elsewhere. Diamonds are now also being recovered from the ocean floor off the Cape of Good Hope. About 30% of all industrial diamonds used in the U.S. are now made synthetically. The energy of the sun and stars can be attributed at least in part to the well-known carbon-nitrogen cycle. Carbon is found free in nature in three allotropic forms: amorphous, graphite, and diamond. A fourth form, known as “white” carbon, is now thought to exist. Graphite is one of the softest known materials while diamond is one of the hardest. Graphite exists in two forms: alpha and beta. These have identical physical properties, except for their crystal structure. Naturally occurring graphites are reported to contain as much as 30% of the rhombohedral (beta) form, whereas synthetic materials contain only the alpha form. The hexagonal alpha type can be converted to the beta by mechanical treatment, and the beta form reverts to the alpha on heating it above 1000° C. In 1969 a new allotropic form of carbon was produced during the sublimation of pyrolytic graphite at low pressures. Under free-vaporization conditions above ~2550 K, “white” carbon forms as small transparent crystals on the edges of the basal planes of graphite. The interplanar spacings of “white” carbon are identical to those of carbon form noted in the graphitic gneiss from the Ries (meteoritic) Crater of Germany. “White” carbon is a transparent birefringent material. Little information is presently available about this allotrope. Of recent interest is the discovery of all-carbon molecules, known as “buckyballs” or fullerenes, which have a number of unusual properties. These interesting molecules, consisting of 60 or 70 carbon atoms linked together, seem capable of withstanding great pressure and trapping foreign atoms inside their network of carbon. They are said to be capable of magnetism and superconductivity and have potential as a nonlinear optical material. Buckyball films are reported to remain superconductive at temperatures as high as 45 K. In combination, carbon is found as carbon dioxide in the atmosphere of the earth and dissolved in all natural waters. It is a component of great rock masses in the form of carbonates of calcium (limestone), magnesium, and iron. Coal, petroleum, and natural gas are chiefly hydrocarbons. Carbon is unique among the elements in the vast number and variety of compounds it can form. With hydrogen, oxygen, nitrogen, and other elements, it forms a very large number of compounds, carbon atom often being linked to carbon atom. There are close to ten million known carbon compounds, many thousands of which are vital to organic and life processes. Without carbon, the basis for life would be impossible. While it has been thought that silicon might take the place of carbon in forming a host of similar compounds, it is now not possible to form stable compounds with very long chains of silicon atoms. The atmosphere of Mars contains 96.2% CO_2. Some of the most important compounds of carbon are carbon dioxide (CO_2), carbon monoxide (CO), carbon disulfide (CS_2), chloroform ($CHCl_3$), carbon tetrachloride (CCl_4), methane (CH_4), ethylene (C_2H_4), acetylene (C_2H_2), benzene (C_6H_6), ethyl alcohol (C_2H_5OH), acetic acid (CH_3COOH), and their derivatives. Carbon has thirteen isotopes. Natural carbon consists of 98.89% 12C and 1.11% 13C. In 1961 the International Union of Pure and Applied Chemistry adopted the isotope carbon-12 as the basis for atomic weights. Carbon-14, an isotope with a half-life of 5715 years, has been widely used to date such materials as wood, archeological specimens, etc. Carbon has many allotropes each having very different physical properties from the other. Graphite (pencil lead) for instance is one of the softest forms of carbon, while diamonds are the hardest. Carbon compounds are named according to the number of carbons present in the basic chain, the presence of single, double or triple bonds, whether or not the carbon chain forms a cyclic structure and the elements or ions that substitute for hydrogens in the chain. A carbon compound with one carbon atom is a methyl-, two is an ethyl- , three is a propyl-, four bytyl-, five penta, six hexa-, etc. Single a bonded hydrocarbon (hydrogen-carbon structure) is an alkane, double bond is an alkene and a triple bond is an alkyne. With more than eighteen million compounds of carbon registered with the Chemical Abstract Registry (CAS), there is much to say about carbon. So much in fact that there is an entire field of chemistry called organic chemistry that is devoted to these compounds. One could get a Ph.D. in organic chemistry and still feel that one had barely gotten their feet wet.