*** Name Origin:**

Greek: zôê (vie).

*** Sources:**

Nitrogen can be made by liquification and then fractional distillation of the air. It is very easily done commercially. It can also be made by heating NaN3 to 300 degrees C.

*** Uses:**

Nitrogen has many industrial uses in the gaseous forms, but probably the most interesting is liquid nitrogen, which is extremely cold. Items that must be frozen to extremely low temperatures for preservation are frequently stored in liquid nitrogen. Fertility clinics store sperm, eggs and embryos used to help infertile couples become pregnant in ampoules in liquid nitrogen.Since nitrogen gas is very stable, at standard temperature and pressure, it is used as the air in inert welding atmospheres. Documents, foods and chemicals are sometimes stored in nitrogen to keep them from oxidizing or reacting with air or water.

*** Additional Notes:**

Discovered by Daniel Rutherford in 1772, but Scheele, Cavendish,Priestley, and others about the same time studied “burnt or dephlogisticated air,” as air without oxygen was then called. Nitrogen makes up 78% of the air, by volume. The atmosphere of Mars, by comparison, is 2.6% nitrogen. The estimated amount of this element in our atmosphere is more than 4000 trillion tons. From this inexhaustible source it can be obtained by liquefaction and fractional distillation. Nitrogen molecules give the orange-red, blue-green, blue-violet, and deep violet shades to the aurora.The element is so inert that Lavoisier named it azote, meaning without life, yet its compounds are so active as to be most important in foods, poisons, fertilizers, and explosives. Nitrogen can be also easily prepared by heating a water solution of ammonium nitrite. Nitrogen, as a gas, is colorless, odorless, and a generally inert element. As a liquid it is also colorless and odorless, and is similar in appearance to water. Two allotropic forms of solid nitrogen exist, with the transition from the a to the b form taking place at –237°C. When nitrogen is heated, it combines directly with magnesium, lithium, or calcium; when mixed with oxygen and subjected to electric sparks, it forms first nitric oxide (NO) and then the dioxide (NO_2); when heated under pressure with a catalyst with hydrogen, ammonia is formed (Haber process). The ammonia thus formed is of the utmost importance as it is used in fertilizers, and it can be oxidized to nitric acid (Ostwald process). The ammonia industryis the largest consumer of nitrogen. Large amounts of gas are also used by the electronics industry, which uses the gas as a blanketing medium during production of such components as transistors, diodes, etc. Large quantities of nitrogen are used in annealing stainless steel and other steel mill products. The drug industry also uses large quantities. Nitrogen is used as a refrigerant both for the immersion freezing of food products and for transportation of foods. Liquid nitrogen is also used in missile work as a purge for components, insulators for space chambers, etc., and by the oil industry to build up great pressures in wells to force crude oil upward. Sodium and potassium nitrates are formed by the decomposition of organic matter with compounds of the metals present. In certain dry areas of the world these saltpeters are found in quantity.

Ammonia, nitric acid, the nitrates, the five oxides (N_2O, NO, N_2O_3, NO_2, and N_2O_5), TNT, the cyanides, etc. are but a few of the important compounds. Production of elemental nitrogen in the U.S. is more than 9 million short tons per year. Natural nitrogen contains two isotopes, ^{14}N and ^{15}N. Ten other isotopes are known. Nitrogen in the elemental form was considered to be inert and was even named ozote which refers to the fact that it is not reactive. Of course nitrogen does form compounds, but the gaseous form consists of diamers (2 nitrogens bonded together). The diamer is very stable. Nitrogen is a major element in organic compounds, especially proteins. Some nitrogen compounds are highly reactive. Trinitrotoluene is TNT or dynamite. Ammonium Nitrate is a fertilizer, but was used as the major explosive ingredient in the Oklahoma City bombing. Anfo, or Ammonium Nitrate and fuel oil mixture is the primary explosive used in the mining industry because it is inexpensive, easy to manufacture and can be easily manufactured near the mine site thus reducing the risks and expenses related to the transportation of explosives. Nitrates, Nitrites and Azides (all nitrogen compounds are either oxidizers or reactives and will react violently under the right conditions.