

getable matters form a portion of charcoal, when they are subjected to a strong heat. The union of carbon with oxygen in proper proportions forms carbonic acid, or the Fixed Air of Dr. Black, who discovered it. This is condensed into a liquid by a pressure of 38 atmospheres at 32° , and is gaseous, transparent, colourless, cannot support combustion, or respiration, is absorbed by an equal bulk of water, and subjected to pressure and combined with an alkali forms the common carbonic acid water. It is found distributed freely throughout nature in the form of carbonates with lime, magnesia, iron, &c.; it exists in many mineral waters—in the air at all heights and situations excepting near the surface of the ocean. It is produced by respiration, combustion, and numerous chemical processes. The chokedamp of mines and the heavy gas oftentimes so prejudicial in breweries, wells and pits, are carbonic acid gas.

Carbon unites freely with hydrogen, giving rise to various compounds.

Nitrogen.

This gas is also called azote, or azotic gas, from a Greek word, signifying "without life," as it is incapable of supporting either respiration or combustion. It exists in the gaseous form unless when in combination with other substances. It is transparent, colourless, insipid, and incombustible. It forms about four-fifths of the atmospheric air, which is a combination of nitrogen and oxygen in proper proportions, holding in suspension some carbonic acid and other gases. Nitrogen exists in almost all the products of the animal kingdom, and enters into a number of important combinations. With hydrogen it forms ammonia, and with carbon forms cyanogen, which is one of the ingredients in Prussian blue, and Prussic, or, hydrocyanic acid.

Hydrogen.

is an element, which is extensively distributed over the face of nature. It exists in almost all the products of the animal and vegetable kingdoms, and forms a ninth part of the water of the globe. It is always obtained in the form of a transparent, colourless gas, when not combined with other substances, and is remarkable for its levity and inflammability; it is the gas obtained for the inflation of balloons in consequence of its lightness. Hydrogen is obtained by the decomposition of water, which is a compound of hydrogen and oxygen. It burns with a pale flame, affording a feeble light; hydrogen unites with a variety of substances, forming interesting compounds.

Oxygen.

This term is derived from two Greek words, signifying "making sour," as this element was formerly supposed to be the basis of acidity; this however is incorrect. Oxygen was formerly called *vital*, *empyreal*, and *dephlogisticated air*. It is gaseous, transparent, inodorous, uninflammable, and supports combustion most brilliantly. The compounds of oxygen, when not acids, are termed *oxides*: the ingredient combining with oxygen is said to be *oxidised*, or, *oxydated*: the process is called *oxidation*. *Deoxidation* signifies the separation of oxygen. Oxygen is the most abundant of the elements, forming upwards of one half of the globe. It exists in air, water, most earthy substances, and in almost all the products of the vegetable and animal kingdoms. The principal oxidating agents are the air, water, oxacids, and salts containing them, as nitrates and chlorates. The principal deoxidating agents are carbon, hydrogen, phosphorus and potassium. It is obtained or prepared from oxide of manganese, the nitrate of potash (salt petre), or any of the salts of