



The Importance of Carbon Dioxide Gas in All Life Processes

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ABSTRACT

The normal functioning of vital processes in all living organisms depends on the amount of carbon dioxide in the human bloodstream. Carbonic anhydride increases the body's resistance to bacterial and viral infections, is important in the metabolism of biologically active substances, that is, in the processes of assimilation and dissimilation. Carbon dioxide is a part of nature and is necessary for many physical and chemical processes. For example, if it did not have the ability to retain heat, the greenhouse effect, which maintains a constant temperature throughout the planet, could not occur. This article discusses the use and importance of carbon dioxide as a chemical raw material. CO₂ gas is not only a polluting gas but also a valuable chemical and a major source of carbon. In addition, carbon dioxide gas is also required for photosynthesis of plants. It is a process in which carbon dioxide is exchanged to release oxygen. This oxygen is necessary for breathing and the realization of life on the planet.

Keywords:

Human bloodstream, carbon dioxide, CO₂ gas

All organisms, including humans, use energy to carry out metabolic reactions during growth, development and reproduction. But organisms cannot directly use light energy for their metabolic needs. On the other hand, light energy must first be converted into chemical energy by means of photosynthesis reactions. Many people think of carbon dioxide as a poisonous gas, but it is not. This is the gas we exhale. If it was toxic or poisonous, it could be harming our respiratory tract and we wouldn't know it.

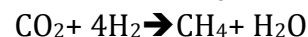
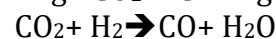
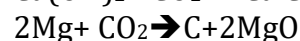
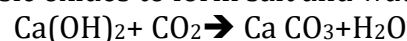
Chemical properties: CO₂ is a colorless, odorless gaseous substance, 1.5 times heavier than air, the atomic mass of carbon dioxide is 44 gm. Its concentration in the earth's atmosphere is about 0.04%, its sublimation temperature is -79 0 C.

Molecular weight: 44.009g/mol
Sublimation point: 79°C
Water solubility: ml/100ml at 20°C: 88
Vapor pressure, kPa at 20°C: 5720
The relative density of steam (air=1) 1.5

Octanol/water partition coefficient log Pow: 0.83

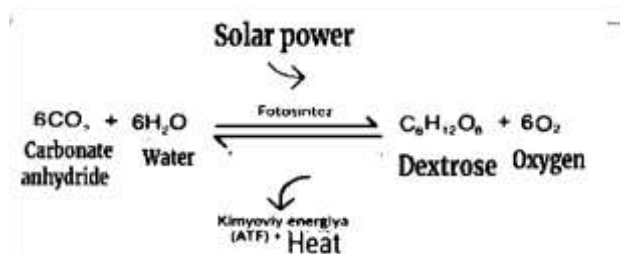
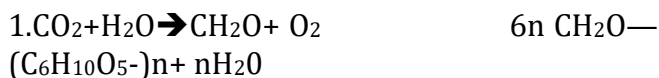
Carbon dioxide belongs to the group of chemically non-reactive substances (along with m: argon, helium, krypton, neon, nitrogen, sulfur, hexafluoride and xenon)

The most important property of CO₂ is that when the pressure is increased, it does not change to a liquid state, it changes to a solid state called "Dry ice", but under certain artificial conditions it can change to a liquid state. produces acid. CO₂ exhibits all the characteristics of acidic oxides. It reacts with acids and basic oxides to form salt and water.

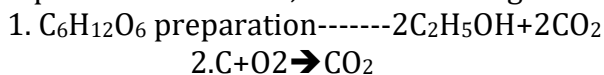


The photosynthesis reaction is the process of converting light energy into chemical energy in the form of carbohydrates. In this process, powered by light energy, glucose

molecules (or other molecules) are formed from water and carbon dioxide, and oxygen is released as a byproduct. Glucose (carbohydrate) molecules provide the body with two important sources: energy and organic carbon.



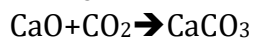
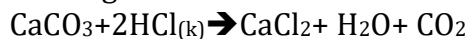
Extraction: CO_2 is produced in nature as a result of the oxidation of organic substances, the decay of plants and animals, and the burning of fuel.



In industry:



In the laboratory: marble is obtained by acidizing chalk.



Significance: The introduction of carbon dioxide into the body causes a breathing reflex in humans. The increase in pressure of the chemical compound stimulates fine nerve endings to send impulses to receptors in the brain and spinal cord. The process of inhalation and exhalation is due to this. If the amount of carbon dioxide in the blood increases, the lungs accelerate its removal from the body. It cannot block ultraviolet rays from the sun entering the atmosphere, but infrared radiation absorbed by carbon dioxide can cause global warming. Carbon dioxide is used in the following areas. The physical properties of carbon dioxide make it a baking powder or preservative in the food industry. In many fire extinguishing systems, especially manual fire extinguishers, it is used to feed aquarium plants, almost all carbonated drinks contain CO_2 , it prevents metal oxidation during welding or in the field of welding, it decomposes under the influence of high temperature and oxygen is released from it.

Released oxygen is dangerous for the process and is used as a deoxidizer to eliminate its negative effects. CO_2 is liquefied carbon dioxide under pressure, as in rifles and welding cylinders. In addition, sodium bicarbonate, which is used in confectionery, creates air bubbles and makes it soft.

CO_2 is also used in the following areas

- stabilizer
- catalyst
- primary or secondary raw materials

Advantages:

- The use of carbon dioxide is relatively cheap, because the price of this substance is much lower than other gases.

- A very common substance
- CO_2 is easy to store and does not require overly complex technological processes
- High reactivity to CO_2

Disadvantages:

- in medicine, it can have a negative effect on patients with gastrointestinal pathologies, that is, the stomach enters the intestinal tract, irritates the mucous membranes and causes damage to the epithelial cells.

Arguably, the main harmful effect of carbon dioxide on health is suffocation due to displacement of oxygen. This happens in high concentrations, which are able to replace oxygen and reduce its concentration below 20%. If there are very enclosed spaces with high concentrations of this gas, it can cause headaches, dizziness, drowsiness, and breathing problems.

Using Solid Carbon Dioxide

Dry ice was originally the more important of the two non-gaseous forms of carbon dioxide.

Its use was first popularized in the United States in the mid-1920y as a refrigerant for food preservation, and it was an important factor in the growth of the ice cream industry in the 1930y. After World War II, changes in compressor design and the availability of special low-temperature steels made it possible to liquefy carbon dioxide gas on a large scale. Because of this, liquid carbon dioxide has begun to replace dry ice in many applications.

Using Liquid Carbon Dioxide

Liquid carbon dioxide has many uses. In some, the chemical composition is important, in others it is not.

From them we get the following: as an inert agent for the growth of plants, as a heat carrier in nuclear power plants, as a refrigerant, chemical agents based on the solubility of carbon dioxide and other purposes.

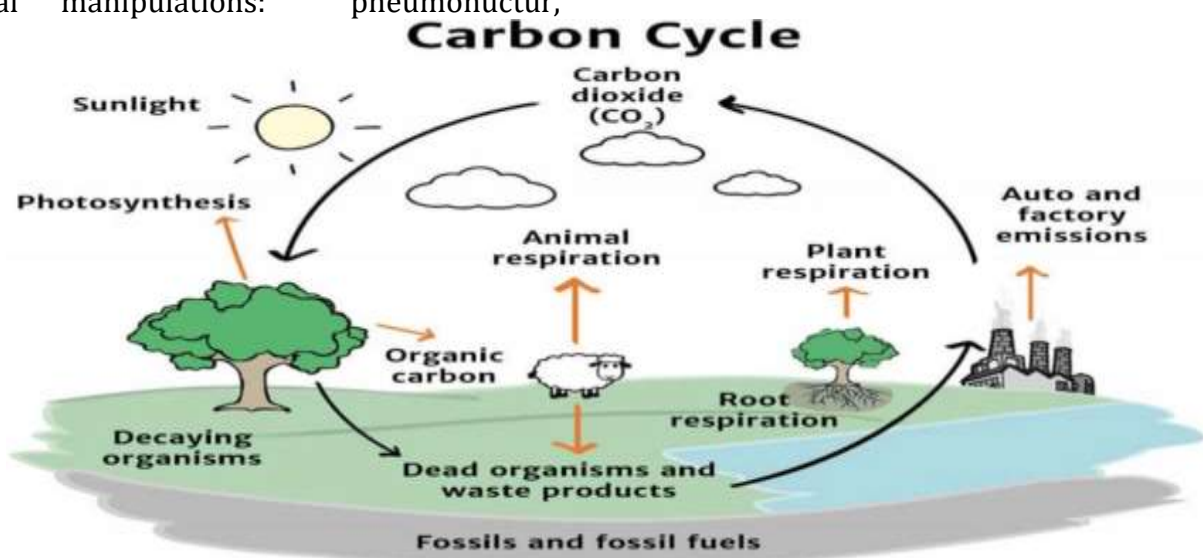
Interesting facts: Complex molecules in the body of all living organisms are built on the basis of a carbon skeleton. You probably already know that humans are carbon-dependent, but have you ever wondered where those carbons come from? So, the carbon atoms in our body were once carbon dioxide CO_2 , C, O, molecules in the air. Carbon atoms accumulate in the bodies of humans and other life forms due to the second step of the photosynthetic process known as the Calvin cycle (or dark phase reactions). In one day, 1 kg of CO_2 is absorbed and metabolized by a person. Scientists have proven that the significant increase in the life expectancy of people living in high mountain areas is associated with a high amount of carbon dioxide in the air. It strengthens immunity, normalizes metabolic processes, strengthens the cardiovascular system. The healing effect of carbon dioxide on the human body is widely used in medicine for the treatment of various diseases: carbonyl baths, beauty salons and medical institutions offer clients unusual medical manipulations: pneumonuctur,

carboxytherapy. If there is an acute shortage of carbon dioxide in the body, then all systems are mobilized and their functional activity increases. All processes in the body are focused on replenishing carbon dioxide reserves in tissues and blood:

- blood vessels narrow, bronchospasm develops in the smooth muscles of the upper and lower respiratory tract, blood vessels
- the structural parts of the lungs increase the amount of mucus
- permeability of large and small blood vessels and capillaries decreases.
- cholesterol begins to accumulate in cell membranes, which leads to their thickening and tissue sclerosis

Carbon dioxide plays an important role in regulating blood pH

The concentration of carbon dioxide has fluctuated throughout the evolution of our planet. There are studies that show how CO_2 was in the atmosphere at different levels depending on the abundance of flora and fauna at that time. It should also be taken into account that its concentration is higher than normal because the industrial revolution has caused our primary energy source to burn. Fuel oil. When these fossil fuels are burned, including coal, oil, and natural gas, they emit large amounts of CO_2 . Be it in industry, power generation or transportation. CO_2 has increased tremendously in recent years.



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