STEMBOT

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Vitamin C investigators

Key words

- Vitamins
- Health
- Chemistry
- Food
- Human body
- Titration

The science behind

Introduction

In the video we have discovered which food has the biggest amount of Vitamin C. The results may differ from our predictions, which fruit or vegetable contains more vitamin C. The biggest amount was found in red pepper and the smallest in vitamin drink.

Method

With the titration method you can measure the amount of Vitamin C. Titration always includes two solutions: test solution and indicator. The test solution, as the name suggests, is the solution to be tested – our fruit, vegetables and drinks. The indicator, however, is the solution that changes colour when the reaction between the test solution and the indicator is completed and both solutions react.

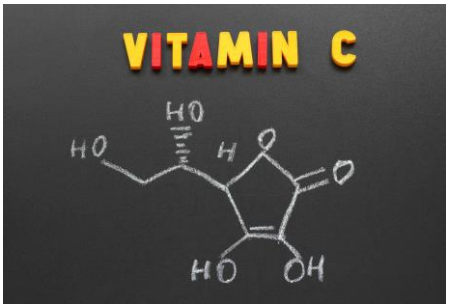
Explanation of the experiment
In our case, different juices were test solutions and a solution of corn starch and iodine, which form a dark blue solution upon

I_2 (iodine) + corn starch → dark blue solution

Solution with vitamin C is added to a solution of corn starch and iodine. When that solution becomes colourless, the end point of the titration is reached. The less drops of indicator turning the solution colourless, the more vitamin C is in the tested solution. For example: if adding 3 drops of juice 1 and 10 drops of juice 2 makes the indicator colourless that tells us, there is more vitamin C in juice 1. Less drops – more vitamin C in juice.

Vitamin C – Ascorbic Acid
Vitamin C or ascorbic acid is a water-soluble vitamin. The term vitamin C encompasses several vitamers that have vitamin C activity in animals. Ascorbate salts such as sodium ascorbate and calcium ascorbate are used in some dietary supplements. These release ascorbate upon digestion. Ascorbate and ascorbic acid are both naturally present in the body, since the forms interconvert according to pH. Oxidized forms of the molecule such as dehydroascorbic acid are converted back to ascorbic acid by reducing agents.

Its formula is $C_6H_8O_6$.



Every day life

Vitamins

Vitamins are substances that are involved in many processes in the body, most often appearing as cofactors in various enzymatic reactions. They are involved in skin renewal, for example, proper functioning of nerves, brain, and immune system, and some also protect cells from free radicals. With few exceptions, our body cannot synthesize them on its own, so we need to consume them through our diet. The need for vitamins is different at different stages of life.

Vitamin C in our body

In our bodies, vitamin C can stay for 24 hours and that means we cannot overload our body with it, as it can be easily excreted with urine, however, we need to consume it regularly to get every beneficial effect of it. Vitamin C can be found in fresh vegetables and fruits, but also in sauerkraut.

Most animals are able to synthesize their own vitamin C. However, apes (including humans) and monkeys (but not all primates), most bats, some rodents, and certain other animals must acquire it from dietary sources.

It is the most important antioxidant in the extracellular fluid in our body. It protects the body from reactive free radicals. It regenerates collagen in bones, joints, and the face. This means it is also beneficial for injuries and wounds. In many studies, there has been a link between cancer prevention and vitamin C because of its anti-oxidant role which reduces cell damage. It is also shown to increase the likelihood of survival during and after the treatment of cancer. Despite the myth that Vitamin C can cure a cold, taking vitamin C before a cold is shown to decrease the length and severity of it, but it is no help once the cold has set in.

Lack of vitamin C

Scurvy was an illness that most sailors faced from lacking fruits and vegetables and for a long time, it was incurable. Eventually, around 1747, a breakthrough was made with a successful treatment of some sick sailors with citrus fruits. It was the only effective treatment and eventually gave sailors the nickname, “limey” - it came from sucking on limes through their voyages to prevent the illness.

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