

Hydrogen

What is hydrogen, the history, properties and things to know about hydrogen.

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The history of hydrogen

In 1766, hydrogen was detected for the first time as a new gas. Henry Cavendish had the idea to decompose vapour with a very hot iron bar. In this decompose process arose the so called *Hydrogene* (v. Gr. Hudoor=water, Gennaoo=generate) or waterforming material, which was translated as hydrogen.

The properties of hydrogen

In the world of chemistry, hydrogen is defined as H₂. H₂ means that a hydrogen molecule consists out of two hydrogen atoms. Hydrogen in the form of gas is very inflammable. When hydrogen comes into contact with fire, it reacts with a 'pop' with oxygen (O₂) and transforms into vapour, that's why they call it waterforming material. The reaction-equation that comes with this process is that two hydrogen molecules react with one oxygen molecule and the atoms divide into two water molecules. $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$. The water molecules can be divided again in hydrogen and oxygen. Under very high temperatures, hydrogen can be fused into helium and there arises from this process a lot of energy. The same process takes place in the sun where the released energy disappears into space and heats the earth.

The occurrence of hydrogen

You can hardly find hydrogen in its pure form. Mostly you find hydrogen in combination with oxygen (H₂O - water), nitrogen (NH₃ - ammonia) or carbon (CH₄ - natural gas). For the winning of hydrogen out of these materials there is a process needed to separate the hydrogen-atoms from the other atoms. This is called a decomposition reaction.

Applications of hydrogen

Hydrogen is a material which gives a lot of energy while burning. In principle, machines can work on hydrogen-energy, but you need hydrogen gas for this process. The problem is that you have to win hydrogen-gas out of a material containing hydrogen atoms. Another problem is that you cannot store the gas 'plain' in, for instance, your car because the gas is very inflammable, so you must burn it when the gas is created. The solution to this problem is the [fuel-cell](#). How the fuel-cell works you can read in the article about the fuelcell. More information about the kind of machinery in which hydrogen is employed in experimental form, you can read about in the article about [applications](#)