

# Chemistry around us

Made by Leontiev Matvey  
6 form  
Vysokoye secondary school  
Teacher Misevra I.E.

- Look around! All that we see: from an elementary match to a beautiful blue sky above your head, you can also consider from another point of view - from the point of view of the remarkable science of chemistry. Yes, yes, the objects with which we are surrounded, which we see every day, without thinking about what they are, can be very surprising and unusual for a chemist.

# History of Glass

The history of glass goes back to antiquity. It is known that in Egypt and Mesopotamia he was able to do it already 6000 years ago. Probably, glass was started to be manufactured later than the first ceramic products, because higher temperatures were required for its production than for clay burning. If only clay is sufficient for the simplest ceramic products, then at least three components are required in the glass composition.



Only the purest varieties of quartz sand are used in glassware, in which the total amount of contaminants does not exceed 2-3%. Particularly undesirable is the presence of iron, which even in minute amounts (tenths of%) stains the glass in a greenish color. If soda  $\text{Na}_2\text{CO}_3$  is added to the sand, it is possible to weld the glass at a lower temperature (200-300 ° C). Such a melt will have less viscous (bubbles are easier to remove during cooking, and products are easier to form). But! Such glass is soluble in water, and products from it are subject to destruction under the influence of atmospheric influences. To impart insolubility to the glass in water, a third component is introduced into it: lime, limestone, chalk. All of them are characterized by the same chemical formula -  $\text{CaCO}_3$ .

# OUR FOOD

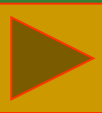
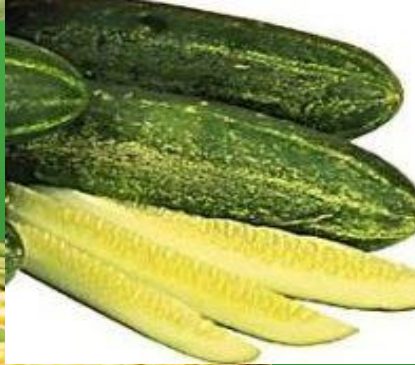
PROTEINS

FATS

CARBOHYDRATES

VITAMINS

AND SO ON...



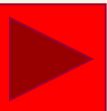
# HOUSE WE LIVE IN ...

concrete,  
reinforced concrete,  
glass, metal

drying oil, var,  
refractory  
impregnation, nails,  
instruments...



brick, paint, asbestos, roofing material.



# Chemical elements in the human body

Many scientists believe that in a living organism not only all chemical elements are present, but each of them performs a certain biological function. Reliably established the role of about 30 chemical elements, without which the human body can not normally exist. These elements are called vital.

The human body consists of 60% water, 34% organic and 6% inorganic substances. The main components of organic substances are carbon, hydrogen and oxygen, they also include nitrogen, phosphorus and sulfur. In the inorganic substances of man there are necessarily 22 chemical elements: Ca, P, O, Na, Mg, S, B, Cl, K, V, Mn, Fe, Co, Ni, Cu, Zn, Mo, Cr, Si, I, F, Se. Scientists agreed that if the mass fraction of the element in the body exceeds 10<sup>-2</sup>%, then it should be considered a macro element. The proportion of microelements in the human body is 10<sup>-3</sup> - 10<sup>-5</sup>%. If the content of the element is below 10<sup>-5</sup>%, it is considered an ultramicroelement.

# Chemical fibers

- Chemical fibers are divided into artificial and synthetic fibers. Artificial fibers are made from natural high-molecular compounds, mainly from cellulose. Synthetic fibers are made from synthetic high-molecular compounds.
- Chemical fibers are made in the form of an endless filament consisting of many individual fibers or of a single fiber, or in the form of a staple fiber - short lengths (staples) of untwisted fiber, the length of which corresponds to the length of the fiber of wool or cotton. Staple fiber, like wool or cotton, serves as a semi-product for yarn production. Before spinning, the staple fiber can be mixed with wool or cotton.

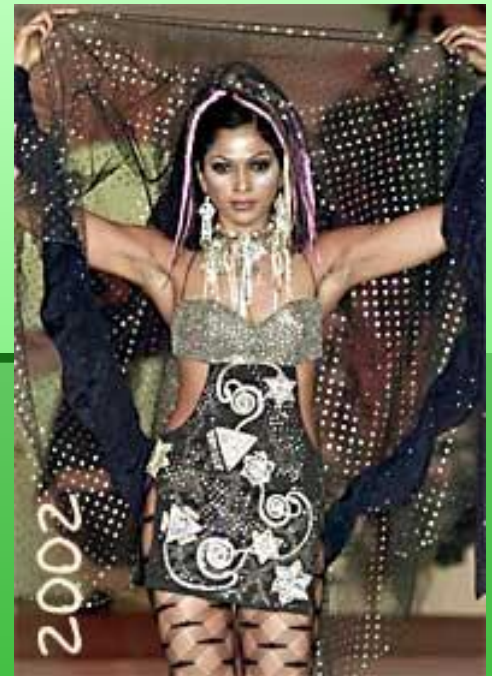


acetate silk

viscose

crimple

capron



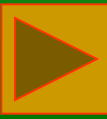
# appliances

metals

polimers

alloys

semiconductors



# Soap and detergents

- Soap was known to man before the new era of chronology. Scientists do not have information about the beginning of cooking soap in the Arab countries and China. The earliest written mention of soap in European countries is found in the Roman writer and scientist Pliny the Elder (23-79 gg.). In the treatise "Natural History" (in 37 volumes), which, in essence, was an encyclopedia of natural science knowledge of antiquity, Pliny wrote about the ways of cooking soap with saponification of fats. Moreover, he wrote about a hard and soft soap, obtained using soda and potash, respectively. Previously, for washing clothes used lye, obtained from the treatment of ash water. Most likely it was before it became known that the ash from the burning of fuel of vegetable origin contains potash.



# and, of course, transport...

chemistry everywhere

metals

Fuel oil

kerosene

petrol

varnishes and paints

diesel oil



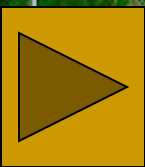
# winged chemistry

**aluminium**

**titanium**

**magnesium**

**and other metals**



# electric lamp

---

The light bulb consists of a glass bottle into which the spiral holders are inserted, and from the spiral itself. The spiral is made of tungsten - one of the most refractory metals. Its melting point is  $3410^{\circ}\text{C}$ . In addition to high refractoriness, tungsten has another very important property - high plasticity. From 1 kg. tungsten can pull the wire length of 3.5 km, which is enough to manufacture 23 thousand 60-watt light bulbs. The holder is made of molybdenum, an analogue element of tungsten. In the periodic table of DI Mendeleev, these two elements are in the same subgroup. The most important property of molybdenum is the small coefficient of linear expansion. When heated, it increases in size in the same way as glass. Since molybdenum and glass change their sizes synchronously with heating and cooling, the latter does not crack and therefore the sealing does not fail.



# The chemical composition of stars

- As the temperature rises, the composition of particles that can exist in the atmosphere of the star becomes simpler. Spectral analysis of stars of the classes O, B, A (temperature from 50 000 to 100 000 C) shows in their atmospheres lines of ionized hydrogen and helium and metal ions, in the class K (5000 C) radicals are already detected, and in class M (3800 C ) - even oxides molecules.



***Chemistry needs  
to be known***