

LESSON 7: GREATEST DISCOVERIES IN CHEMISTRY

- I. Think about an invention or a discovery throughout the history of a human mankind that in your opinion was the most important (or you are most grateful for)
- II. Put the discoveries/inventions on the board in the order of importance (1 being the most important). Be ready to justify your decision.
- III. Put the discoveries below in the right order (from the earliest to the latest one)
 1. Discovering oxygen
 2. Combining atoms
 3. Atomic weight
 4. Synthetic urea
 5. Periodic table
 6. Electricity transforms chemicals
 7. Radioactivity
 8. Plastics
 9. Electrons form bonds
 10. Atoms signature light
- IV. In your pairs prepare a short presentation on one of the discoveries above (your teacher will tell you which one)
- V. Watch the video on Atoms Signature Light and answer the questions

(source: <http://science.discovery.com/videos/greatest-discoveries-chemistry>, visited 17.09.2011)

Useful vocabulary:

ENGLISH	CZECH	ENGLISH	CZECH
to conduct an experiment	provést pokus	to spread	rozprostřít, rozpřáhnout
to determine	určit, zjistit	device	zařízení, přístroj
to indicate	ukázat, být známkou	spectrum (pl.:spectra)	spektrum
flame	plamen	burner	hořák
shade	odstín, tón	to pass through	projít
to remind of sth/sb	připomenout něco	ribbon	stuha
prism	prizma	bar code	čárový kód
to feature	obsahovat	legacy	dědictví, odkaz
tool	nástroj, nářadí	exploration	průzkum, (pro)bádání

1. What are the names of the two scientists who discovered the phenomenon?
2. How was the first spectroscope built? Why?
3. What did the combinations of bright colours and dark lines indicate? What do they compare them with in the film?
4. Which two elements were discovered by the two scientists, thanks to this method?
5. What else did they discover?
6. Is the method used in the modern science?

VI. SPECTROSCOPY TODAY; Read the part of the article assigned to you by your teacher and then tell the other students in your group what it is about

Uses of Infrared Spectroscopy

By Deyanda Flint, eHow Contributor

- Infrared spectroscopy is defined as a method for the identification of substances based on their absorption of infrared wavelengths. It is a study of how the molecules of substances can absorb infrared radiation and transform it into heat. Infrared spectroscopy utilizes a machine that applies infrared rays to a substance. The job of the machine, called an infrared spectrometer, is to record the number of wavelengths absorbed by a substance. Infrared spectroscopy has many benefits in the field of science and technology.

Forensic Analysis and Crime Investigation

- Since infrared spectroscopy is useful for the identification and confirmation of the identity of materials and substances, the method is beneficial to the field of forensic analysis. With the aid of integrated computer databases and machines capable of performing infrared spectroscopy, almost any substance or material can be identified. Computer databases have records of known infrared absorbance graphs. Infrared spectroscopy plays an important role in crime investigation because it can help authorities to solve crimes and locate criminal offenders. The evidence gathered from the scene of the crime can be examined closely with the use of this method. The results can provide clues to a criminal's whereabouts. For example, infrared spectroscopy can be used to find a car model by simply subjecting a paint chip to infrared spectroscopy.

Chemical Analysis: Testing Pill Quality

- According to "Medical News Today," scientists at the University of Maryland have been successful in using the method of near-infrared spectroscopy (NIR) to make a prediction regarding quick dissolution of pills inside the body. The success of the experiment can help drug manufacturers in checking the quality of pills to benefit consumers in the health industry. Pills can be tested for consistencies because any imbalance in pill ingredients can prove to be lethal. The Food and Drug Association (FDA) can also use the method of infrared spectroscopy for checking and identifying materials in the manufacture of medicines. The FDA regulates drug companies and protects consumers from potential health disasters.

Chemistry Applications

- Using infrared spectroscopy, it is possible to measure the degree of polymerization in chemical compounds. Polymerization happens when monomer molecules undergo chemical reaction to form polymer chains. Infrared spectroscopy can measure the changes in the nature and quantity of molecular bonds. Portable instruments that can measure infrared spectroscopy are used in field trials. This method is important for researchers in identifying more uses of different substances to improve the lives of modern society. Medical breakthroughs are not far behind. The analysis of molecular compounds can lead to the discovery of new chemical compounds that can produce useful products.

(source:http://www.ehow.com/list_5920264_uses-infrared-spectroscopy.html#ixzz1YFJFgbYw, visited 17.09.2011)

Article vocabulary:

infrared - infračervené

absorption - vstřebávání

utilize - využít

apply - aplikovat

to record - zaznamenat

forensic analysis – forenzní analýzy

confirmation - potvrzení

to solve crimes – vyřešit zločiny

locate - lokalizovat

offender - pachatel

evidence - důkaz

clues - stopy

whereabouts – místo pobytu

by subjecting - podrobením

a chip of paint -

dissolution - rozpuštění

make prediction - předpovědět

consistency - důslednost

lethal - smrtící

identify - identifikovat

regulate - regulovat

drug companies – farmaceutické společnosti

chemical compounds - sloučeniny

monomer molecules – monomerní molekuly

portable - přenosný

field trials – terenní studia

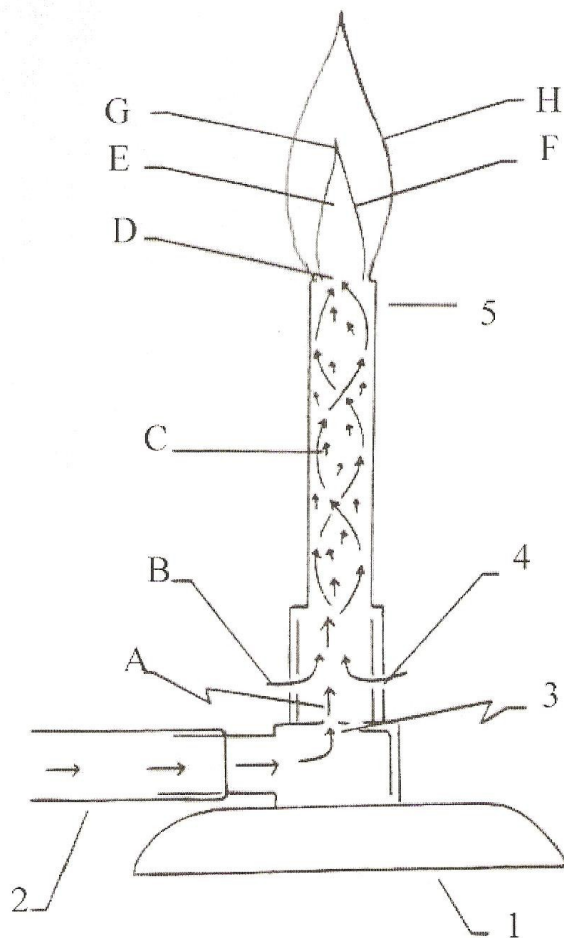
breakthrough – průlom

VII. THE BUNSEN BURNER: A. Label the picture with the words or phrases below:IGNITION, OUTER CONE, BASE, ORIFICE, GAS HOSE, TOP, VERY FAST MOVING STREAM OF GAS, BARREL, AIR & GAS MIXED TOGETHER, OUTER CONE, INNER CONE, AIR IS DRAWN IN BY THE FAST MOVING JET OF METHANE GAS, AIR VENTS

Bunsenburner.JPG (JPEG obrázek, 510x803 bodů)

<http://www.wine.com.net/jhalpin/Bunsenburner.JPG>

Cross Section of the Bunsen Burner



B. Complete the text below with descriptions from the picture

The diagram depicts the exposed cross section of the Bunsen burner as though it had been cut down the middle. The dotted lines represent the flow of gas through the burner. The 1_____ supports the Bunsen burner holding it in an upright position. Natural gas is provided in pressurized gas pipelines. When the gas valve is opened, gas rushes into the 2_____ and through a small 3_____. It is a 4_____ (e.g. air escaping from a balloon). As methane gas rushes up into the 5_____, it passes 6_____, which permit air to enter the Bunsen burner. This 7_____. Then the 8_____ in the barrel insure a "good mixture" for burning. The mixture leaves the barrel at the _____. There is very little heat at this point. 9_____ occurs above the barrel of the burner (*Light the burner here!*). If properly adjusted, the flame of the burner will have an 10 _____ and an 11_____ above it. The 12_____ is at the tip of the inner cone.