CLIL

Periodic Table of the Elements

Vytvořeno v rámci projektu Zvýšení jazykové kompetence

2016-1-CZ01-KA101-023159

Erasmus + Vzdělávací mobilita jednotlivců – Mobilita – Mobilita pracovníků školy

Periodic Table of the Elements

Could Mendeleev have got a Nobel prize?

Periodic Table of the Elements

a tabular arrangement of the chemical elements ordered by

- their atomic number
- electron configurations
- recurring chemical properties

History of the Periodic Table

Metals of Antiquity

- gold
- silver
- copper
- tin
- lead
- iron
- mercury
- carbon
- sulphur
- zinc
- arsenic
- antimony

Middle Ages

up to 1799

other 21 elements

discovered during the age of Enlightenment

Antoine-Laurent de Lavoisier
classified elements as metals and non-metals

19th century
more than 60 elements known

Johann Wolfgang Döbereiner

- formed some of the elements into groups of three – triads

chlorine, bromine, and iodine
calcium, strontium, and barium
sulfur, selenium, and tellurium
lithium, sodium, and potassium

each triad had related properties

19th century

- John Newlands

classified the sixty-two known elements into eight groups, based on their physical properties

No.	No.	No.	No.	No.	No.	No.	No.
H 1	F 8	Cl 15	Co & Ni 22	Br 29	Pd 36	I 42	Pt & Ir 50
Li 2	Na 9	K 16	Cu 23	Rb 30	Ag 37	Cs 44	Os 51
G 3	Mg 10	Ca 17	Zn 24	Sr 31	Cd 38	Ba & V 45	Hg 52
Bo 4	Al 11	Cr 19	Y 25	Ce & La 33	U 40	Ta 46	Tl 53
C 5	Si 12	Ti 18	In 26	Zr 32	Sn 39	W 47	Pb 54
N 6	P 13	Mn 20	As 27	Di & Mo 34	Sb 41	Nb 48	Bi 55
O 7	S 14	Fe 21	Se 28	Ro & Ru 35	Te 43	Au 49	Th 56

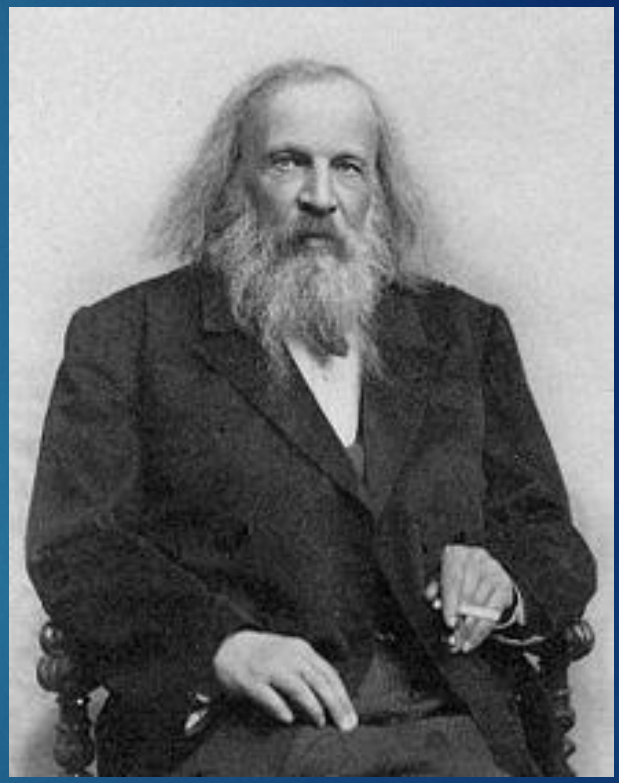
Picture 1 Newland's table of the elements

Lothar Meyer
1864

- worked on a periodic table independently of Mendeleev
- 28 elements were classified by valence, not atomic weight
- his work was published in 1864 a few moths before Mendeleev
- no prediction of new elements
- considered a co-author of the periodic table

Dimitri Ivanovic Mendeleev

- a Russian chemist and inventor
- considered the most famous Russian and Slavic chemist
- devoted to anorganic, organic and physical chemistry, aeronautics, meteorology, measurement techniques
- designed industrial process of ratification of oil
- produced smokeless gunpowder



Picture 2

Mendeleev's work

the first scientist to make a periodic table similar to the one used today

arranded the elements by atomic mass

elements exhibited the periodicity of properties

expected the discovery of many yet unknown elements

predicted the discovery of new elements and left spaces for them

- eka-silicon (germanium)
- eka-aluminium (gallium)
- eka-boron (scandium)

Mendeleev's 1871 periodic table

Picture 3

Dimitri Mendeleev

introduced the first logical classification system of elements

specified 3 undiscovered elements

predicted some other elements

his work overtook the period of 50 years

did not get a Nobel prize – one ballot was missing

20th century

Henry Moseley – an English physicist

1913 - discovered atomic numbers

specified some positions of elements

Glenn T. Seaborg – an American nuclear chemist

discovered and investigated 10 transuranium elements and more than 100 isotops

1951 Nobel prize for Chemistry

Mendeleev's_law

The chemical and physical properties of the elements

recur periodically when the elements

are arranged in the order

of their atomic weights

Current Periodic Law

Properties of elements recur periodically as atomic numbers increase

Vocabulary I

- Antiquity
- Middle Ages
- Enlighment
- Modern Times

- starověk
- středověk
- osvícení
- novověk

Vocabulary II

- chemical element
- atomic number
- electron configuration
- chemical property
- metals, non-metals
- valence
- law
- ballot

- chemický prvek
- protonové číslo
- elektron. konfigurace
- chemická vlastnost
- kovy, nekovy
- mocenství
- zákon
- hlasovací lístek

Vocabulary III

- clasify
- recur
- discover
- form
- relate
- publish
- predict
- devote

- třídit, zařadit
- vracet se, opakovat
- objevit
- utvořit, formulovat
- vztahovat
- uveřejnit
- předpovědět
- věnovat, zasvětit

Vocabulary IV

- design
- produce
- invent
- arrange
- exibit
- investigate
- increase
- overtake

- navrhnout
- vytvořit, vyrobit
- vynalézt
- uspořádat, upravit
- vystavit, projevit
- zkoumat, vyšetřovat
- zvýšit
- předběhnout

Questions

- 1. What is the Periodic Table of Elements?
- 2. How are the elements arranged?
- 3. What metals were known in antient times?
- 4. How many elements were known in 19th century?
- 5. Who got the Nobel Prize for Chemistry?
- 6. Why did not Mendeleev get the award?

Go to http://www.ptable.com/?lang=cs and show:

- Noble gases
- Other nonmetals
- Alkali metals
- Alkali earth metals
- Metaloids
- Nontransition metals
- Transition metals
- Lanthanides
- Actinides

Použité zdroje

- Pic.1John Newlands (chemist). (2017, July 9). In *Wikipedia, The Free Encyclopedia*. Retrieved11:45, July 11, 2017 from https://en.wikipedia.org/w/index.php?title=John_Newlands_(chemist)&oldid=789837217
- Pic.2 Dmitri Mendeleev. (2017, June 21). In *Wikipedia, The Free Encyclopedia*. Retrieved11:37, July 11, 2017 from https://en.wikipedia.org/w/index.php?title=Dmitri_Mendeleev&oldid=786779129
- Pic 3 History of the periodic table. (2017, June 26). In *Wikipedia, The Free Encyclopedia*. Retrieved11:44, July 11, 2017 from https://en.wikipedia.org/w/index.php?title=History_of_the_periodic_table&oldid=787647523