Pravi pocetak - sve (varijable,konstante,formule, jednacine, teorije) iz tri konstante : c h G

Formula sa kojom se moze raditi u svim oblastima . Moze se poci od bilo koje formule napravljene od c h1 i G

$$\frac{\left[\frac{\left[\pi \cdot 4 \cdot \sqrt{\frac{3}{4 \cdot \pi \cdot G}} \cdot \left(\frac{1}{\sqrt{\frac{c^5}{G^2 \cdot h1}}}\right)\right]}{2}\right]^{-1} \cdot h1}{C_1} = 13.60563\ \text{eV}$$

Kao sto vidimo dobili smo energiju osnovnog stanja vodonika u elektron-voltima.

$n := 1 .. 10$

Jonizaciona energija i radijusi atoma od 1 do 8 Mendeljejevog sistema

Izracunavanje jonizacione energije atoma od vodonika do neona samo pomoci tri fundamentalne konstante h, c, G

$C1 := 0.83$

$$k2 := \begin{pmatrix} H \\ He \\ Li \\ Be \\ B \\ C1 \\ N \\ O \\ F \\ Ne \end{pmatrix}$$

$$\frac{\left[\frac{\left[\pi \cdot 4 \cdot \sqrt{\frac{3}{4 \cdot \pi \cdot G}} \cdot \left(\frac{1}{\sqrt{\frac{c^5}{G^2 \cdot h1}}}\right)\right]}{2}\right]^{-1} \cdot h1}{C_1} \cdot k2_n$$

13.60563	eV
24.6262	
5.44225	
9.38789	
8.29944	
11.29268	
14.55803	
13.60563	
18.09549	
21.63296	

Radijusi atoma od 1 do 8 samo sa tri konstante i jednim dimenzionim koeficijentom

$$\frac{\left[\pi \cdot 4 \cdot \sqrt{\frac{3}{4 \cdot \pi \cdot G}} \cdot \left(\frac{1}{\sqrt{\frac{c^5}{G^2 \cdot h1}}}\right)\right]}{6.25458 \times 10^{-35}\,\text{statohm}} = 5.29177 \times 10^{-9}\,\text{cm}$$

$$\frac{\left[\pi \cdot 4 \cdot \sqrt{\frac{3}{4 \cdot \pi \cdot G}} \cdot \left(\frac{1}{\sqrt{\frac{c^5}{G^2 \cdot h1}}}\right)\right]}{} \cdot k2_n$$

$$6.25458 \times 10^{-35} \text{statohm}$$

$5.29177 \cdot 10^{-9}$	cm
$9.57811 \cdot 10^{-9}$	
$2.11671 \cdot 10^{-9}$	
$3.65132 \cdot 10^{-9}$	
$3.22798 \cdot 10^{-9}$	
$4.39217 \cdot 10^{-9}$	
$5.6622 \cdot 10^{-9}$	
$5.29177 \cdot 10^{-9}$	
$7.03806 \cdot 10^{-9}$	
$8.41392 \cdot 10^{-9}$	

$$k2 := \begin{pmatrix} H \\ He \\ Li \\ Be \\ B \\ C1 \\ N \\ O \\ F \\ Ne \end{pmatrix}$$

Sada idemo u drugu oblast.Nalazimo Ridbergovu konstantu. Potom trazimo i nalazimo serije talasnih brojeva atoma vodonika

$$2.035 \cdot 10^{48} \cdot \frac{\left(\frac{1}{G}\right)^{\left(\frac{1}{2}\right)}}{\left[\left[\frac{c^5}{\left(G^2 \cdot h1\right)}\right]^{\left(\frac{1}{2}\right)} \cdot cm \cdot sec\right]} = 1.09698 \times 10^5 \frac{1}{cm}$$

$$\frac{\left[\pi \cdot 4 \cdot \sqrt{\frac{3}{4 \cdot \pi \cdot G}} \cdot \left(\frac{1}{\sqrt{\frac{c^5}{G^2 \cdot h1}}}\right)\right]}{\left(3.01767 \times 10^{-48} \, cm \, sec\right)} = 1.0968 \times 10^5 \, \frac{1}{cm}$$

Balmerova serija. Pomocu tri konstante i koeficijenta srazmernosti

$m := 3 .. 10$

$$\frac{\left[\pi \cdot 4 \cdot \sqrt{\frac{3}{4 \cdot \pi \cdot G}} \cdot \left(\frac{1}{\sqrt{\frac{c^5}{G^2 \cdot h1}}}\right)\right]}{\left(3.01767 \times 10^{-48} \, cm \, sec\right)} \cdot \left(\frac{1}{2^2} - \frac{1}{m^2}\right)$$

$1.52333 \cdot 10^4$	$\frac{1}{cm}$
$2.0565 \cdot 10^4$	
$2.30328 \cdot 10^4$	
$2.43733 \cdot 10^4$	
$2.51816 \cdot 10^4$	
$2.57063 \cdot 10^4$	
$2.60659 \cdot 10^4$	
$2.63232 \cdot 10^4$	

$\psi := 1033 \cdot 10^4$

$\omega_H := c \cdot \frac{\alpha}{a_0}$

$x := r_e$

$$\frac{-h1^2}{2 \cdot m_e} \cdot \frac{d^2}{dx^2}\psi + \frac{m_e \cdot \omega_H{}^2 \cdot x^2}{2} \cdot \psi = 6.38547 \times 10^{-13} \, erg$$

$$\pi \cdot 4 \cdot \sqrt{\frac{3}{4 \cdot \pi \cdot G}} \cdot \frac{1}{\sqrt{\frac{c^5}{G^2 \cdot h1}}} = 3.30978 \times 10^{-43} \, sec$$

$t_e = 5.90597 \times 10^{-23} \, sec$

$r_e \equiv 2.81794 \times 10^{-13} \, cm$

$$h1 \equiv \frac{h}{2 \cdot \pi}$$

$$c \equiv 299792458 \cdot \frac{m}{sec}$$

$$kon \equiv 2.92333 \times 10^{26}$$

Velocity of light in vacuum

$$t_e \equiv \frac{r_e \cdot 2 \cdot \pi}{c}$$

$$\mu_0 \equiv 4 \cdot \pi \cdot 10^{-7} \cdot \frac{newton}{amp^2}$$

$\frac{kon}{k2} =$

	1
1	$2.92333 \cdot 10^{26}$
2	$1.6151 \cdot 10^{26}$
3	$7.30832 \cdot 10^{26}$
4	$4.23671 \cdot 10^{26}$
5	$4.79234 \cdot 10^{26}$
6	$3.52208 \cdot 10^{26}$
7	$2.73208 \cdot 10^{26}$
8	$2.92333 \cdot 10^{26}$
9	$2.19799 \cdot 10^{26}$
10	$1.83857 \cdot 10^{26}$

Permeability of vacuum

$$k2 \equiv \begin{pmatrix} 1.0 \\ 1.81 \\ 0.40 \\ 0.69 \\ 0.61 \\ 0.83 \\ 1.07 \\ 1.0 \\ 1.33 \\ 1.59 \end{pmatrix}$$

$$\varepsilon_0 \equiv 8.854187817 \cdot 10^{-12} \cdot \frac{farad}{m}$$

$$C \equiv kon \cdot k2$$

Permittivity of vacuum

$$\frac{a_0}{k2} =$$

	1
1	$5.29177 \cdot 10^{-9}$
2	$2.92363 \cdot 10^{-9}$
3	$1.32294 \cdot 10^{-8}$
4	$7.66924 \cdot 10^{-9}$
5	$8.67504 \cdot 10^{-9}$
6	$6.37563 \cdot 10^{-9}$
7	$4.94558 \cdot 10^{-9}$
8	$5.29177 \cdot 10^{-9}$
9	$3.97878 \cdot 10^{-9}$
10	$3.32816 \cdot 10^{-9}$

cm

$$G \equiv 6.67259 \cdot 10^{-11} \cdot \frac{m^3}{kg \cdot sec^2}$$

$$eV \equiv 1.60217733 \cdot 10^{-19} \cdot joule$$

$$G = 6.6726 \times 10^{-8} \frac{cm^3}{gm\,sec^2}$$

C =

	1
1	$2.92333 \cdot 10^{26}$
2	$5.29123 \cdot 10^{26}$
3	$1.16933 \cdot 10^{26}$
4	$2.0171 \cdot 10^{26}$
5	$1.78323 \cdot 10^{26}$
6	$2.42636 \cdot 10^{26}$
7	$3.12796 \cdot 10^{26}$
8	$2.92333 \cdot 10^{26}$
9	$3.88803 \cdot 10^{26}$
10	$4.64809 \cdot 10^{26}$

Newtonian constant of gravitation

$$\frac{el^2}{2.92363 \cdot 10^{-9} \cdot cm \cdot 2} = 24.62632\,eV$$

$$M_s \equiv 1.989 \times 10^{33} gm$$

$$h \equiv 6.6260755 \cdot 10^{-34} \cdot joule \cdot sec$$

$$Rg_s \equiv \frac{G \cdot M_s}{c^2}$$

$$h1 \equiv \frac{h}{2 \cdot \pi}$$

Planck's constant (h)

Electromagnetic Constants

$$el \equiv 1.60217733 \cdot 10^{-19} \cdot coul$$

Elementary charge

$$\Phi_0 \equiv 2.06783461 \cdot 10^{-15}$$

$$\Phi_0 = 2.06783 \times 10^{-15}$$

Magnetic flux quantum

$$M_{Bor} \equiv 9.2740154 \cdot 10^{-24} \cdot \frac{joule}{stattesla}$$

Bohr magneton

$$M_{Bor} = 9.27402 \times 10^{-24} \frac{joule}{stattesla}$$

$$5.0507866 \cdot 10^{-27} \cdot \frac{joule}{stattesla}$$

Nuclear magneton

Atomic Constants

$\alpha \equiv 7.29735308 \cdot 10^{-3}$

$\alpha \equiv 7.29735 \times 10^{-3}$

Fine structure constant

$Ryd \equiv 10973731.534 \cdot m^{-1}$

Rydberg constant

$a_0 \equiv 0.529177249 \cdot 10^{-10} \cdot m$

Bohr radius

$E_h \equiv 4.3597482 \cdot 10^{-18} \cdot joule$

Hartree energy

Quantum of circulation

$3.63694807 \cdot 10^{-4} \cdot \frac{m^2}{sec}$

Electron

$m_e \equiv 9.1093897 \cdot 10^{-31} \cdot kg$

Electron mass

Electron specific charge (electron charge to mass ratio)

$-1.75881962 \cdot 10^{11} \cdot \frac{coul}{kg}$

Electron Compton wavelength

$2.42631058 \cdot 10^{-12} \cdot m$

$ECw \equiv 2.42631058 \cdot 10^{-12} \cdot m$

$ECw = 2.42631 \times 10^{-10} cm$

$r_e \equiv 2.81794092 \cdot 10^{-15} \cdot m$

Classical electron radius

$928.47701 \cdot 10^{-26} \cdot \frac{joule}{tesla}$

Electron magnetic moment

Muon

$m_\mu \equiv 1.8835327 \cdot 10^{-28} \cdot kg$

Muon mass

Proton

$m_p \equiv 1.6726231 \cdot 10^{-27} \cdot kg$

Proton mass

$k \equiv c^2$

Ratio of proton mass to electron mass

$k = 8.98755 \times 10^{20} \frac{cm^2}{sec^2}$

1836.152701

Proton Compton wavelength

$1.32141002 \cdot 10^{-15} \cdot m$

$1.41060761 \cdot 10^{-26} \cdot \frac{joule}{tesla}$

Proton magnetic moment

Proton gyromagnetic ratio

$26751.5255 \cdot 10^{4} \cdot \frac{rad}{sec \cdot tesla}$

Neutron

$m_n \equiv 1.6749286 \cdot 10^{-27} \cdot kg$

Neutron mass

Neutron Compton wavelength

$1.31959110 \cdot 10^{-15} \cdot m$

Physico-Chemical Constants

$N_A \equiv 6.0221367 \cdot 10^{23} \cdot mole^{-1}$

Avogadro constant

Atomic mass constant

$AMU \equiv 1.6605402 \cdot 10^{-27} \cdot kg$

$96485.309 \cdot \frac{coul}{mole}$

Faraday constant

$8.314510 \cdot \frac{joule}{mole \cdot K}$

Molar gas constant

$$k_b \equiv 1.380658 \cdot 10^{-23} \cdot \frac{\text{joule}}{K}$$

Boltzmann's constant

Molar volume of ideal gas at STP

$$22.41410 \cdot \frac{\text{liter}}{\text{mole}}$$

$$\sigma \equiv 5.67051 \cdot 10^{-8} \cdot \frac{\text{watt}}{m^2 \cdot K^4}$$

Stefan-Boltzmann constant

$$3.7417749 \cdot 10^{-16} \cdot \text{watt} \cdot m^2$$

First radiation constant

$$0.01438769 \cdot m \cdot K$$

Second radiation constant

$$M_s \equiv 1.989 \cdot 10^{33} \cdot \text{gm}$$

$$7.65496 \times 10^{-25}$$

$$M_z \equiv 5.977 \cdot 10^{27} \cdot \text{gm}$$

$$h = 6.62608 \times 10^{-27} \frac{\text{gm}\,\text{cm}^2}{\text{sec}}$$

$$m_{Pl} \equiv \frac{c^2 \cdot \sqrt{G \cdot \frac{h}{c^3}}}{G}$$

$$m_{Pl} = 5.45621 \times 10^{-5}\,\text{gm}$$

$$L_{Pl} \equiv \sqrt{G \cdot \frac{h}{c^3}}$$

$$\sqrt{G \cdot \frac{h}{c^3}} \cdot k2 = \text{(table)}\ \text{cm}$$

	1
1	$4.05083 \cdot 10^{-33}$
2	$7.33201 \cdot 10^{-33}$
3	$1.62033 \cdot 10^{-33}$
4	$2.79507 \cdot 10^{-33}$
5	$2.47101 \cdot 10^{-33}$
6	$3.36219 \cdot 10^{-33}$
7	$4.33439 \cdot 10^{-33}$
8	$4.05083 \cdot 10^{-33}$
9	$5.38761 \cdot 10^{-33}$
10	$6.44082 \cdot 10^{-33}$

$$L_{Pl} = 4.05083 \times 10^{-33}\ \text{cm}$$

$$r_s \equiv 6.9598 \cdot 10^5 \cdot \text{km}$$

$$r_z \equiv 6.37817 \cdot 10^3 \cdot \text{km}$$

$$Md \equiv \frac{m_e}{\left(2.4 \times 10^{-43}\right)}$$

Data from CRC Handbook of Chemistry and Physics, 73nd edition, edited by David R. Lide, CRC Press (1992).