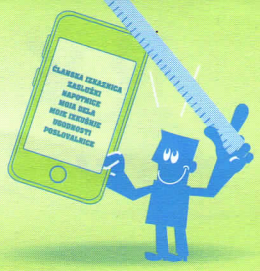


SEMINAR

Vezavna energija e^- v H-atomu je 3,4 eV. Izrazi to v kcal/mol?
Pov. oddaljenost e^- od jedra je $1{,}058 \cdot 10^{-10}$ m. Å = ?

$3{,}4\ eV = 3{,}4 \cdot 1{,}6 \cdot 10^{-19}\ AsV = \underline{5{,}44 \cdot 10^{-19}\ J}$

$5{,}44 \cdot 10^{-19}\ J = \underline{1{,}305 \cdot 10^{-19}\ cal} \rightarrow$

$1{,}305 \cdot 10^{-19} : 6{,}023 \cdot 10^{-23} =$

$= 7{,}86 \cdot 10^{4}\ cal/mol =$

$= \underline{78{,}6\ \frac{kcal}{mol}}$

$\underline{Å^2 = 1{,}058\ Å}$ je razdalja

Gostota e^- je $7{,}38\ Å^{0-3} \rightarrow$ v osnovni enoti? v mol/L?

$7{,}83\ \frac{1}{Å^3} = 7{,}38\ \frac{1}{(10^{-10}\ m)^3} = 7{,}38\ \frac{1}{10^{-30}\ m^3}$

$= \underline{7{,}38 \cdot 10^{30}\ m^{-3}}$

$\underline{\frac{7{,}38 \cdot 10^{30}\ mol}{6{,}023 \cdot 10^{23} \cdot 10^{3}\ dm^3} = 1{,}225 \cdot 10^{4}\ \frac{mol}{L}}$

$E = (h\nu)$

r [m] $\quad r_0$ – nova enota $\quad r^* = \frac{r}{r_0}$

$m_e = 9{,}1 \cdot 10^{-31}\ kg$

$e_0 = 1{,}6 \cdot 10^{-19} \cdot 1\ As$

$\hbar = \frac{h}{2\pi} = 1{,}054571628 \cdot 10^{-34}\ Js$

$\frac{1}{4\pi\varepsilon_0} \Rightarrow \varepsilon_0 = 8{,}85 \cdot 10^{-12}\ \frac{As}{Vm}$

$m_p = ?$ $\quad m_p = 1{,}672\ldots 10^{-27}\ kg$

$m_p^* = \frac{m_p}{m_e} = \frac{1{,}67\ldots 10^{-27}\ kg}{9{,}1\ldots 10^{-31}\ kg} \doteq 1{,}84 \cdot 10^3 \doteq 1836$

masa protona je 1836-krat večja od m. e^-

$c = 3 \cdot 10^8\ m\,s^{-1}$

$V = \frac{J}{As} = \frac{kg\,m^2}{As^3}$ $\quad N = \frac{kg\,m}{s^2}$ $\quad J = \frac{kg\,m^2}{s^2}$

$m_e[kg]\ kg^n \cdot \left(\frac{kg\,m^2}{s}\right)^m \cdot \left(\frac{kg\,m^3}{A^2 s^4}\right)^\sigma \cdot \underbrace{(As)^p}_{e_0[As]} = m/s$

$\hbar\left[\frac{kg\,m^2}{s}\right]$ $\quad \frac{1}{4\pi\varepsilon_0}\left[\frac{kg\,m^3}{A^2 s^4}\right]$

$kg^{n+m+\sigma} \cdot A^{-2\sigma+p} \cdot m^{2m+3\sigma} \cdot s^{m-4\sigma+p} = m/s = kg^0 A^0 \cdot m^1 s^{-1}$

$n+m+\sigma = 0$

$-2\sigma + p = 0$

$2m + 3\sigma = 1$

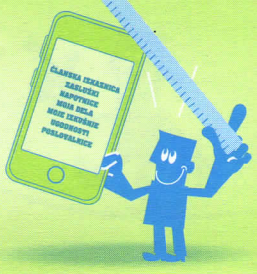
$-m - 4\sigma + p = -1$

(11)

$a.u\ v = \frac{1}{4\pi\varepsilon_0} \cdot \frac{e_0^2}{\hbar} = 2187691{,}180\ m/s$

$c^* = \frac{c}{a.u\,v} = \frac{3 \cdot 10^8\ m/s}{2187691{,}180\ m/s} =$

$= 137{,}13$



$1\,a.u\,E = 27,211387\,eV = 4,3597 \cdot 10^{-18}\,J$ Hartree

$\frac{m_e e_0^4}{(4\pi\varepsilon_0)^2 \hbar^2}$

$J = \frac{kg\,m^2}{s^2}$

$1\,a.u\,r = 5,29177 \cdot 10^{-11}\,m$ Bohrov radij

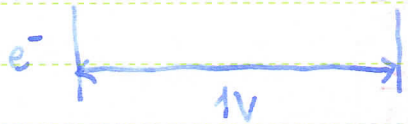
$\frac{4\pi\varepsilon_0 \cdot \hbar^2}{m_e e_0^2}$

na nazaj:

$x_n = B \sin \frac{\omega_n}{c} x \rightarrow x_n = B \sin \frac{n\pi x}{l}$ $\quad \omega_n = \frac{n\pi c}{l}$

- FOTOEFEKT
- SEVANJE ČRNEGA TELESA
- SPEKTRI ATOMOV IN MOLEKUL
- ŽGRADBA ATOMOV IN MOLEKUL
- RADIOAKTIVNOST
- ⋮

} neznanka na področju KLASIČNE FIZIKE

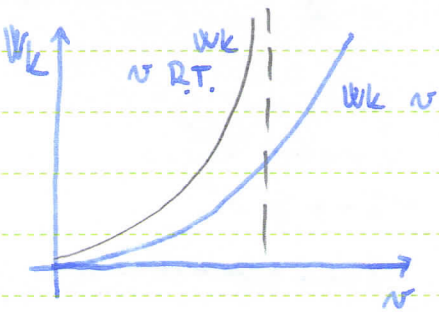


$W_k = 1\,eV$

Ko elektron premaga napetost 1 V, ima kin. energijo 1 eV.

$A = eU$ $\quad = \quad A = \Delta W_k = W_k - W_{k_0} = W_k$

$W_k = \frac{1}{2} m v^2$



N. M. - Newt. mehanika
R. T. - relat. teorija