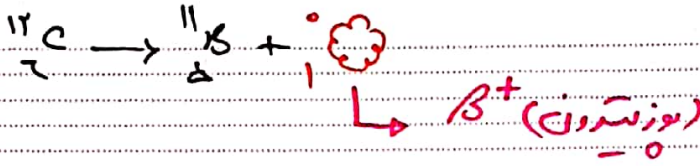




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Nuclear physicist

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$$W_T = \Delta K$$

$$\text{برای } \beta^{-}: W_T = K_2 - K_1 \Rightarrow -m \times 10^3 \times 52 = -K_1 \Rightarrow K_1 = 1400 \text{ J}$$

$$\text{برای } \beta^{+}: W_T = K_2 - K_1 \Rightarrow -m \times 10^3 \times h' = -1400 \Rightarrow h' = 1400 \frac{\text{J}}{\text{kg}}$$

$$\Delta L = \alpha L_1 \Delta \theta$$

$$9 = 1.2 \times 10^{-4} \times 900 \times \Delta \theta \Rightarrow \Delta \theta = 10^{\circ} \text{C}$$

$$W = -P \Delta V > 0 \Rightarrow \Delta V < 0 \Rightarrow \text{تراکم}$$

$$\downarrow W \Rightarrow T \downarrow \sim PV = nRT \rightarrow (PV) \downarrow \Rightarrow$$

$$PV_1 < PV_2$$



Mehrdadsalimi1989@gmail.com , Tel: 09180044801

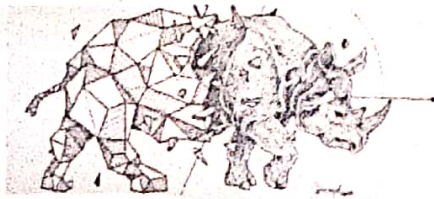




Dr. M. Salimi
Nuclear physicist

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$$T = \mu R \sqrt{\frac{r^3}{GM}} \Rightarrow T^2 = \frac{\mu^2 R^2 r^3}{GM} \Rightarrow T^2 \propto r^3$$

$$\vec{p} = (vt - r) \hat{i}$$

$$\vec{p}_i(1s) = -r \hat{i}$$

$$\vec{p}_f(4s) = r \hat{i}$$

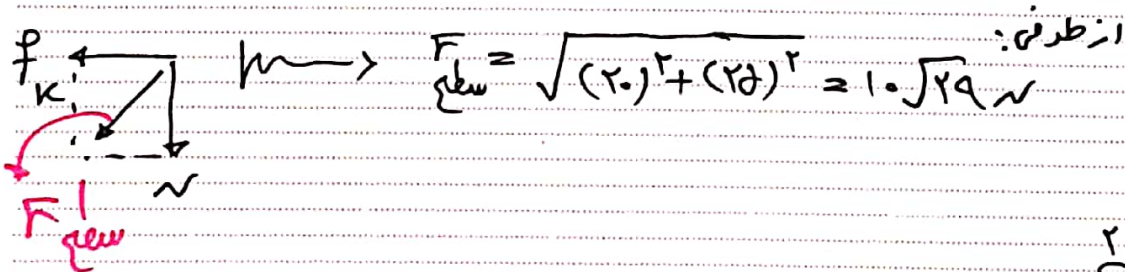
$$\Rightarrow \Delta p = r \hat{i} \Rightarrow \vec{F}_T = \frac{\Delta p}{\Delta t} = \frac{r \hat{i}}{r} = \hat{i}$$

$$f_{s \max} = \mu_s N = \mu_s mg = 0.4 \times 10 = 4 \text{ N}$$

$$f_k = \mu_k N = \mu_k mg = 0.3 \times 10 = 3 \text{ N}$$

$$F > f_{s \max} \Rightarrow F_T = ma \Rightarrow 29 - 20 = 2a \Rightarrow 9 = 2a$$

$$\Rightarrow a = 4.5 \frac{m}{s^2}$$



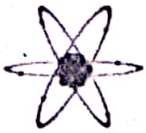
$$F = m \frac{v^2}{r} \Rightarrow F = 2000 \times \frac{25}{20} = 2500$$

نیروی اصطکاک استاتیکی



Mehrdadsalimi1989@gmail.com . Tel: 09180044801

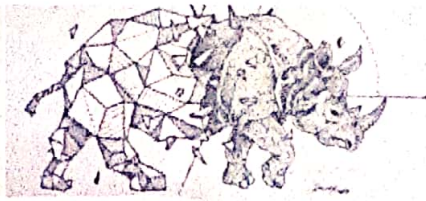




Dr. M. Salimi
Nuclear physicist

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$$L = 4m \quad n=2 \quad \rightarrow \quad f_2 = 2f_1 = 200 \Rightarrow f_1 = 100 \text{ Hz}$$

$$f_1 = \frac{v}{\lambda} \Rightarrow 100 = \frac{v}{1.2} \Rightarrow v = 120 \frac{\text{m}}{\text{s}}$$

$$\beta_2 - \beta_1 = 10 \cdot \log \left(\frac{P_2}{P_1} \times \left(\frac{r_1}{r_2} \right)^2 \right) = 20 \cdot \log 2 = 9 \text{ dB}$$

$$T = 2\pi \sqrt{\frac{L}{g}} \Rightarrow T \propto \sqrt{L} \Rightarrow \frac{T_2}{T_1} = \sqrt{\frac{L_2}{L_1}}$$

$$\Rightarrow \frac{1.125 T_1}{100 T_1} = \sqrt{\frac{L_1 + 1.2}{L_1}} \Rightarrow L_1 = 2.8 \text{ cm} = 2.8 \times 10^{-2} \text{ m}$$

$$T_1 = 2\pi \sqrt{\frac{L}{g}}$$

$$T_1 = 2\pi \sqrt{\frac{2.8 \times 10^{-2}}{9.8}} = 2 \times (1.1) = 1.125 \text{ s}$$

$$T = \frac{2\pi}{\omega} \Rightarrow T = \frac{1}{\nu} \text{ s}$$

$$L = 2A \Rightarrow \bar{S} = \frac{d}{\Delta t} \Rightarrow 1.2 = \frac{2A}{0.2} \Rightarrow A = 1.2 \text{ cm}$$

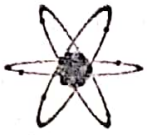
$$L = \frac{\lambda}{2} = 25 \text{ cm} \Rightarrow \lambda = 100 \text{ cm} = 1 \text{ m}$$

$$\lambda = vT \Rightarrow 1 = 250 T \Rightarrow T = \frac{1}{250} \text{ s} = \frac{4}{1000} \text{ s} = 4 \times 10^{-3} \text{ s} = 4 \text{ ms}$$



Mehrdadsalimi1989@gmail.com . Tel: 09180044801

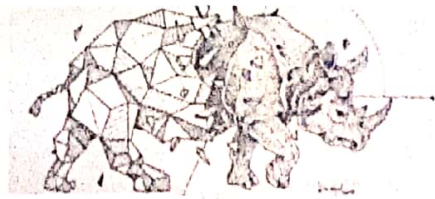




Dr. M. Salimi
Nuclear physicist
Department of Physics, Shahrood University of Technology

"شمیبه نامه"

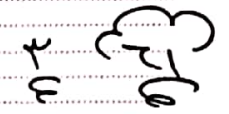
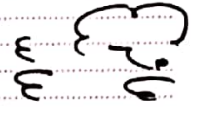
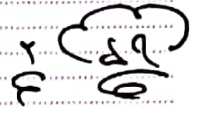
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$$- 18.2 \text{ eV} \quad \text{---} \quad n_2 = 2$$

$$- 13.6 \text{ eV} \quad \text{---} \quad n_1 = 1$$

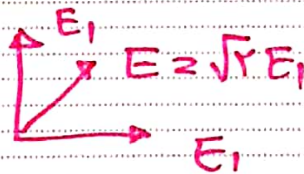
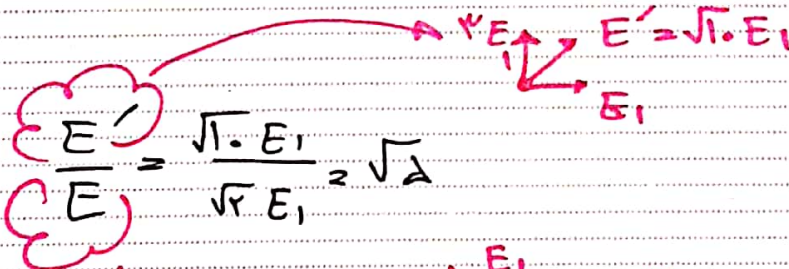
$$hf = E_2 - E_1 = 13.6 \text{ eV}$$



$$\frac{u_2}{u_1} = \left(\frac{r_2}{r_1}\right)^2 \quad \leftarrow \quad v \propto v^2 \quad v = \frac{1}{2} c v^2$$

$$v_2 - v_1 = -\frac{v}{14} u_1$$

$$\Delta v = \frac{\Delta u}{q} \Rightarrow \Delta v = \frac{2 \times 10^{-3}}{-2 \times 10^{-8}} = -10^5 \text{ V}$$



$$I' = \frac{2.2}{1} = 2.2 \text{ A}$$

$$I = \frac{E}{R_T + r} = \frac{2}{1.0} = 2 \text{ A}$$



Mehrdadsalimi1989@gmail.com . Tel: 09180044801





Dr. M. Salimi
Nuclear physicist

Department of Physics, Arak Institute of Medical Sciences

"ضمیمه نامه"

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$$B = \frac{\mu_0 I}{2R}$$

$$B = \frac{12 \times 10^{-7} \times \frac{1}{2}}{2 \times 10^{-1}} = 2 \times 10^{-2} T$$

$$B_1 \perp B_2 \Rightarrow \underline{B_{1,2}} = \sqrt{2} \times 10^{-2} T \Rightarrow B_T = \sqrt{2} \times 10^{-2} T$$

$$L = \frac{\mu_0 N^2 A}{l} = \frac{4\pi \times 10^{-7} \times 10^2 \times 10^{-4} \times 1 \times 10^{-2}}{10 \times 10^{-2}} = 4 \pi \times 10^{-4} H$$

$$|\bar{E}| = N \frac{\Delta \varphi}{\Delta t} = N \frac{A \Delta B \cos \theta}{\Delta t} = 4 V$$

$$P = \frac{mg}{A} \Rightarrow 10^{-2} = \frac{10 \times m}{2 \times 10^{-2}} \Rightarrow m = 20 g$$



Mehrdadsalimi1989@gmail.com Tel: 09180044801



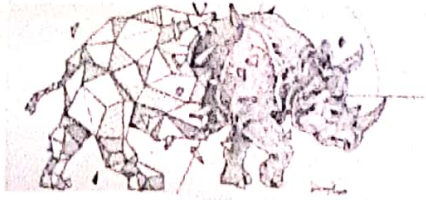


Dr. M. Ghalini
Nuclear physicist

Department of Physics, Azad Institute of Medical Sciences

"شیمی تاب"

دکتر مهرداد سلیمی - متخصص فیزیک هسته ای



$$W_T = \Delta K$$

$$W_1 + W_2 = \Delta K$$

$$W_F + W_{Fk} = \Delta K \Rightarrow 2000 \times \frac{1}{2} \times \frac{1}{2} - 1000 \times \frac{1}{2} = \Delta K$$

$$\Delta K = 2500 \text{ J}$$

$$Q_e = \frac{m_1 c_1 \theta_1 + m_2 c_2 \theta_2 + m_3 c_3 \theta_3}{m_1 c_1 + m_2 c_2 + m_3 c_3} = \frac{100 \cdot 1 + 200 \cdot 2 + 300 \cdot 3}{100 + 200 + 300} = \frac{1400}{600} = 2.33 \text{ } ^\circ\text{C}$$

$$\rho_1 v_1 = \rho_2 v_2$$

$$\left(\frac{v_1}{\Delta x_1} + \rho_0 \right) (\epsilon_0) = \left(\frac{v_2}{\Delta x_2} + \rho_0 \right) (\epsilon_0)$$

$$\rho_0 = 9.1 \times 10^{-31} \text{ kg}$$



Mehrdadsalimi1989@gmail.com . Tel: 09180044801

