Contents

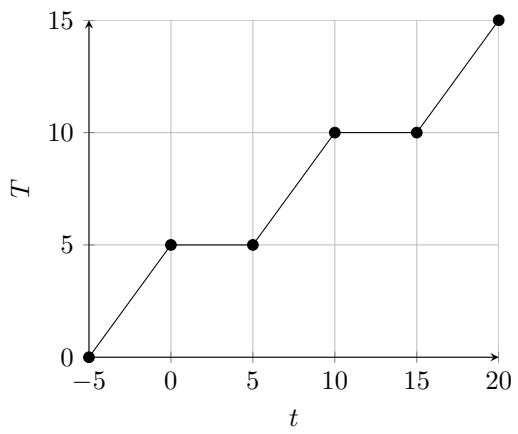
Permbledhje:
Tremujori - 2

Kristian Blido

13-03-2021

9 Fizika Termike

9.1 Ndryshimi i Gjendjes dhe Energjise



$$\begin{array}{rcll}]-5,0[& \rightarrow & \text{Ngrohje} & Q = c \cdot m \cdot \Delta T \\ ]0,5[& \rightarrow & \text{Shkrirje} & Q = \lambda \cdot m \\ ]5,10[& \rightarrow & \text{Ngrohje} & Q = c \cdot m \cdot \Delta T \\ ]10,15[& \rightarrow & \text{Avullim} & Q = q \cdot m \\ ]15,20[& \rightarrow & \text{Ngrohje} & Q = c \cdot m \cdot \Delta T \end{array}$$

9.2 Energjia e Brendshme

$$U = \begin{cases} \frac{3}{2} \cdot R \cdot T \cdot n, & 1 \quad \text{atom} \\ \frac{5}{2} \cdot R \cdot T \cdot n, & 2 \quad \text{atome} \\ 3 \cdot R \cdot T \cdot n, & 3+ \quad \text{atome} \end{cases}$$

$$\begin{aligned} R &= N_A \cdot k_B \\ &= 6.02 \cdot 10^{23} \frac{}{mol} \cdot 1.38 \cdot \frac{m^2 kg}{10^{23} \cdot s^2 \cdot K^1} \\ &= 8.31 \frac{m^2 \cdot kg}{s^2 \cdot K \cdot mol} \\ &= 8.31 \frac{J}{mol \cdot K} \end{aligned}$$

$$n = \frac{m}{M} = \frac{N}{N_A}$$

$$T(K) = T(^\circ C) + 273.15$$

10 Gazet Ideale

10.1 Ligji i gazeve

$$P \cdot V = N \cdot k_b \cdot T$$

$$P \cdot V = n \cdot (N_A \cdot k_B) \cdot T$$

$$P \cdot V = n \cdot R \cdot T$$

10.2 Energjia Kinetike

$$\begin{aligned} P &= \frac{1}{3} \cdot \frac{N}{V} \cdot m \cdot < v^2 > \\ &= \frac{2}{3} \cdot \frac{N}{V} \cdot < \epsilon_k > \end{aligned}$$

$$< \epsilon_k > = \frac{3}{2} \cdot k_B \cdot T$$

10.3 Parimi i pare i Termodinamikes

$$Q = \Delta U + A$$

"Sasia e nxehtesise qe merr nje sistem shkon pjeserisht per ndryshimin e energjise se brendshme dhe pjeserisht per kryerjen e punes"

10.4 Izoproceset

10.4.1 Procesi Ciklik

- 2 rruge Termodinamike
- Sisteme *Quasi-Statike*

$$\left\{\begin{matrix} T_1 & = & T_2 \\ \Delta U & = & 0 \\ Q & = & A \end{matrix}\right\}$$

10.4.2 Procesi Izotermik

$$\frac{P_1}{P_2} = \frac{V_2}{V_1}$$

$$\left\{\begin{matrix} T_1 & = & T_2 \\ \Delta U & = & 0 \\ Q & = & A \end{matrix}\right\}$$

10.4.3 Izobarik

$$\frac{V_1}{V_2} = \frac{T_1}{T_2}$$

$$\left\{\begin{matrix} P_1 & = & P_2 \\ Q & = & \Delta U + A \end{matrix}\right\}$$

10.4.4 Izohorik

$$\frac{P_1}{T_2} = \frac{P_2}{T_2}$$

$$\left\{\begin{matrix} V_1 & = & V_2 \\ A & = & 0 \\ Q & = & \Delta U \end{matrix}\right\}$$

10.4.5 Procesi Adiabatik

$$\left\{\begin{matrix} Q & = & 0 \\ A & = & -\Delta U \end{matrix}\right\}$$

10.5 Parimi i dyte i Termodinamikes

"Nuk mund te ekzistoje motorri i perjetshem"

$$A = Q_i - Q_f$$

$$A = T_i - T_f$$

Rendimenti $\rightarrow \eta$

$$\left\{\begin{matrix} \eta = \frac{A}{Q_i} \\ \eta < 1 \end{matrix}\right\} \left\{\begin{matrix} \eta = \frac{A}{T_i} \\ \eta < 1 \end{matrix}\right\}$$

11 Fusha Elektrike

11.1 Intensiteti i Fushes Elektrike

$$E = \frac{F}{q}\left(\frac{N}{C}\right)$$

11.2 Ligji i Kulonit

$$\begin{aligned} |\vec{F}| &= k \cdot \frac{Q_1 \cdot Q_2}{\epsilon \cdot r^2} \\ &= \frac{1}{4 \cdot \pi \cdot \epsilon_0} \cdot \frac{Q_1 \cdot Q_2}{\epsilon \cdot r^2} \\ &= \frac{Q_1 \cdot Q_2}{4 \cdot \pi \cdot \epsilon_0 \cdot \epsilon \cdot r^2} \end{aligned}$$

Ku $\epsilon_0 = 8.85 \cdot 10^{-12} \frac{F}{m}$ dhe $k = 9 \cdot 10^9 \frac{N\, m^2}{C^{-2}}$

11.3 Intensiteti i Fushes Elektrike Qendrore

$$\begin{aligned} E &= \frac{F}{q} \\ &= \frac{\frac{Q_1 \cdot q}{4 \cdot \pi \cdot \epsilon_0 \cdot \epsilon \cdot r^2}}{q} \\ &= \frac{Q}{4 \cdot \pi \cdot \epsilon_0 \cdot \epsilon \cdot r^2} \end{aligned}$$

11.4 Potenciali Elektrik

$$V = \frac{W_P}{q}$$

11.5 Intensiteti i Fushes se Njetrajtshme

$$\begin{aligned} A &= W_P \\ F \cdot \Delta d &= \Delta V \cdot q \\ \frac{F}{q} &= \frac{\Delta V}{\Delta d} \\ E &= -\frac{\Delta V}{\Delta d} \end{aligned}$$

11.6 Potenciali i Fushes Qendrore

$$V = \frac{q}{4 \cdot \pi \cdot \epsilon_0 \cdot \epsilon \cdot r}$$

12 Kondensatoret

12.1 Kapaciteti

$$C = \frac{q}{V}(F)$$

12.1.1 Kapaciteti i Percjellesit

$$C = \frac{q}{\Delta V} = \frac{q}{U}$$

12.2 Energjia e Kondesatorit

$$\begin{aligned} W &= \frac{Q \cdot V}{2} \\ &= \frac{(C \cdot V) \cdot V}{2} \\ &= \frac{C \cdot V^2}{2} \\ &= \frac{Q^2}{2 \cdot C} \end{aligned}$$

12.3 Dendesia e Ngarkesave

$$\begin{aligned} \text{lineare} &\rightarrow \lambda, \quad \lambda = \tfrac{q}{l} \\ \text{siperfaqje} &\rightarrow \sigma, \quad \sigma = \tfrac{q}{s} \\ \text{vellim} &\rightarrow \rho, \quad \rho = \tfrac{q}{v} \end{aligned}$$

12.4 Kapaciteti i Kondensatorit

$$\begin{cases} E = \frac{q}{S \cdot \epsilon \cdot \epsilon_0} \\ E = \frac{V}{d} \end{cases}$$

$$\frac{Q}{S \cdot \epsilon \cdot \epsilon_0} = \frac{V}{d}$$

$$\frac{q}{V} = C = \frac{\epsilon \cdot \epsilon_0 \cdot S}{d}$$

12.4.1 Depertueshmeria Elektrike

$$\epsilon = \frac{C}{C_0}$$

$$\epsilon_0 = \frac{1}{\mu_0 \cdot c}$$

$\epsilon_0 \rightarrow$ Pershkueshmeria elektrike ne vakum
$\mu_0 \rightarrow$ Pershkueshmeria magnetike vakum
$c \rightarrow$ Shpejtesia e drietes ne vakum

12.5 Lidhja e Kondensatoreve

12.5.1 Ne Paralel

$$\begin{aligned} C &= \sum C_i \\ \Delta V &= V_1 = V_2 = V_3 = \ldots = V_i \\ q &= \sum q_i \end{aligned}$$

12.5.2 Ne Seri

$$\begin{aligned} \tfrac{1}{C} &= \sum \tfrac{1}{C_i} \\ \Delta V &= \sum V_i \\ q &= q_1 = q_2 = q_3 = \ldots = q_i \end{aligned}$$

13 Rryma Elektrike

13.1 Rryma

$$I = \frac{\Delta Q}{\Delta t} \quad (A)$$

13.2 Dendesia e Rrymes

$$J = \frac{I}{S}$$

13.3 Forca Elektro Motorre

$$\epsilon = \frac{A}{q} = \frac{q \cdot V}{q} = \Delta V$$

13.4 Rezistenca Elektrike

$$R = \rho \cdot \frac{l}{S}$$

13.5 Ligji i Ohmit

$$I = \frac{\epsilon}{R + r}$$

13.6 Fuqia Elektrike

$$\begin{aligned} P &= \frac{W}{\Delta t} \\ &= \frac{V \cdot \Delta Q}{\Delta T} \\ &= V \cdot I \\ &= I^2 \cdot R \\ &= \frac{V^2}{R} \end{aligned}$$

13.7 Ligji i Joul-Lencit

$$Q = I^2 \cdot R \cdot \Delta t$$

14 Qarqet elektrike

14.1 Ligji i pare i Kirkofit

"Shuma algjebrike e intensiteteve te rrymave qe hyjne ne nje pike cfaredo te qarkut jane te barabarta me shumen e intesiteteve qe dalin nga ajo pike"

$$\sum I_{in} = \sum I_{out}$$

14.2 Ligji i dyte i Krikofit

"Shuma e drejtuar e diferencave te potencialit rreth nje laku te mbyllur eshte 0"

$$\sum_{k=1}^{n} V_k = 0$$

14.3 Lidhja e Rezistencave

14.3.1 Ne Seri

$$\begin{aligned} \Delta V &= \sum V_i \\ I &= I_1 = I_2 = I_3 = \ldots = I_i \\ R &= \sum R_i \end{aligned}$$

14.3.2 Ne Paralel

$$\begin{aligned} \Delta V &= V_1 = V_2 = V_3 = \ldots = V_i \\ I &= \sum I_i \\ \tfrac{1}{R} &= \sum \tfrac{1}{R_i} \end{aligned}$$

14.4 ΔV ne skajet e burimit

$$V = \epsilon - I \cdot r$$

15 Fusha Magnetike

15.1 Induksioni

$$B = \frac{F_A}{I \cdot L \cdot \sin\theta}$$

15.2 Forca e Amperit

Vepron mbi rrymen.

$$F_A = B \cdot I \cdot L \cdot \sin\theta$$

15.3 Momenti magnetik dhe efekti rrotullues

$$\begin{aligned} M &= F \cdot d \\ &= B \cdot \sin\theta \cdot [I \cdot (L \cdot d)] \\ &= B \cdot \sin\theta \cdot [I \cdot S] \\ &= B \cdot \sin\theta \cdot P \end{aligned}$$

ku $P \rightarrow$ Momenti magnetik i spires.

15.4 Forca e Lorencit

Vepron mbi ngarkesen.

$$\begin{aligned} F_L &= F_A \\ &= B \cdot I \cdot L \cdot \sin\theta \\ &= B \cdot \frac{Q}{\Delta t} \cdot L \cdot \sin\theta \\ &= B \cdot Q \cdot \frac{L}{\Delta t} \cdot \sin\theta \\ &= B \cdot Q \cdot v \cdot \sin\theta \end{aligned}$$

15.5 Orbita e ngrkesave

$$\begin{aligned} F_q &= F_L \\ \frac{m \cdot v^2}{r} &= B \cdot Q \cdot v \cdot \sin\theta \\ r &= \frac{m \cdot v}{Q \cdot B \cdot \sin\theta} \end{aligned}$$

15.6 Raporti $\frac{q}{m}$

$$\begin{aligned} \frac{m \cdot v^2}{r} &= B \cdot Q \cdot v \cdot \sin\theta \\ \frac{q}{m} &= \frac{v}{r \cdot B \cdot \sin\theta} \end{aligned}$$

$$\begin{aligned} \frac{m \cdot v^2}{2} &= V \cdot q \\ \frac{q}{m} &= \frac{v^2}{2 \cdot V} \end{aligned}$$

$$\begin{aligned} \frac{v}{r \cdot B \cdot \sin\theta} &= \frac{v^2}{2 \cdot V} \\ v &= \frac{2 \cdot V}{B \cdot r \cdot \sin\theta} \end{aligned}$$

$$\frac{q}{m} = \frac{2 \cdot V}{B^2 \cdot r^2 \cdot \sin^2\theta}$$

16 Induksioni Elektromagnetik

16.1 Fluksi Magnetik

$$\Phi = B_N \cdot S \ \ (Wb = T \cdot m^2)$$

ku $B_N \rightarrow$ Perbersja e Induksionit sipas normales se siperfaqjes.

16.2 Ligji i Faradei-Lencit

$$\epsilon = -\frac{\Delta\Phi}{\Delta t}$$