TEMPERATURA

$\overline{W_n} = N\frac{3}{2}kT$ povpr. translacijska energija

$\overline{W_n} = N\frac{5}{2}kT$ za dvoatomno molekulo

$\overline{W_n} = 3kT$ za večatomno molekulo

$\bar{v} = \sqrt{\frac{2\overline{W}}{\mu}}$ povprečna hitrost molekul

$v_0 = \sqrt{\frac{2kT}{\mu}}$ najverjetnejša hitrost molekul

$W_n = mcT$ notranja energija ($c = \frac{3k}{2Mu}$)

$da = a\alpha dT$ raztezek v željeni dimenziji

$\Delta l = \alpha l \cdot \Delta T$ linearni raztezek

$\Delta V = \beta V \cdot \Delta T$ prostorninski razt. ($\beta = 3\alpha$)

$\Delta V = V\chi p$ χ - stisljivost snovi

$p = E\frac{\Delta l}{l}$ tlak (E je prožnostni modul)

$p = \frac{nR}{V}T$ tlak, če je V stalen (posoda)

$A = -p\Delta V$ delo tlaka

$c_p = c_v + \frac{p\Delta V}{m\Delta T}$ c_p pri volumnu, c_v pri tlaku

$C = mc_p$ toplotna kapaciteta

PLINSKI ZAKONI

$pV = NkT$ enačba stanja (N št. Molekul)

$\frac{p}{\rho} = \frac{R}{Mkg}T$ enačba stanja (ko rabimo ρ)

$\frac{p_0V_0}{T_0} = \frac{p_1V_1}{T_1}$ $\frac{p_0}{\rho_0T_0} = \frac{p_1}{\rho_1T_1}$

$W_{k1} = \frac{3mv_x^2}{2}(prečna!)$

ELEKTRIČNO POLJE

$F = eE$

$U = Ed$

$E = CU$

$U = \Delta V$ V el.potencial

$A = F_e s$

$A = Ee(h_2 - h_1)$

$A = e(V_2 - V_1)$

$V = Eh$

$w = \frac{\varepsilon_0 E^2}{2} = \frac{CU^2}{2V} = \frac{W}{V}$ gostota el. energije

$F = eE$

$F = \frac{e_1e_2}{4\pi\varepsilon_o r^2}$ električna sila

$E = \frac{F}{e} = \frac{e}{4\pi\varepsilon_0 r^2}$ jakost električnega polja okoli točke

$U = \frac{e}{4\pi\varepsilon_0 r}$ potencial

$E = \frac{\sigma}{\varepsilon_0} = \frac{d*e}{S*\varepsilon_0}$ v homogenem el. polju 2 plošči

$E = \frac{\sigma}{2\varepsilon_0}$ v okolici 1 ravne plošče

$\sigma = \frac{e}{S}$ ploskovna gostota naboja

$E = \frac{E_0}{\varepsilon}$ oslabljeno polje v snovi

$A = eEh = eU$ v homogenem el. polju

$C = \frac{e}{U} = \varepsilon\varepsilon_0\frac{S}{d}$ kapaciteta kondenzatorja

$W_e = \frac{e_1e_2}{4\pi\varepsilon_0 r}$ električna potenc. energija

$W_e = \frac{CU^2}{2}$

$a = \frac{eE}{m}$ pospešek el. delca

$F = 6\pi\beta rv$ β viskoznost zraka

$\varepsilon_0 * I = \phi_e$

ELEKTRIČNI TOK

$e = I\,t$

$R_n = \frac{U_g - U}{I}$

$U = RI$

$I = n\,e_0$

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

$1\,\Omega\frac{mm^2}{m} = 10^{-6}\,\Omega m$

$\frac{\Delta R}{R} = \alpha\Delta T$

$R = \xi\frac{l}{S}$ ξ - električna upornost

$R = \frac{U_vR_v}{I_AR_v - U_v}$ V vzp. na R; A zap. na oba

$R = \frac{U_v}{A_A} - R_A$ V vzporedno na R in A

$R = R_v(\frac{U}{U_0} - 1)$ predupornik za voltmeter

$R = R_A\frac{I_0}{I - I_0}$ predupornik za ampermeter

$I = jS$

$A = UI\Delta t$ električno delo

$P = UI = RI^2 = \frac{U^2}{R}$ elekrtična moč

$Q = P\Delta t = I^2R\Delta t$ Joulova toplota

$\Delta T = \frac{\xi\Delta t}{\rho c}(\frac{I}{S})^2$ temperatura žičke

$j = \frac{I}{S}$ gostota el. toka

Vzporedna vezava kondenzatorjev

$C = \sum C_i$ $e_1 = C_1 * U$

$U = U_1 = U_2$

$e = e_1 + e_2 = (C_1 + C_2)U$

Vzporedna vezava uporanikov

$R = \frac{R_1R_2}{R_1 + R_2}$ | $I = I_1 + I_2 + I_3$ |

$\frac{I_1}{I_2} = \frac{R_2}{R_1}$ $U = U_1 = U_2$

$I_1 + I_2 = U(\frac{1}{R_1} + \frac{1}{R_2}) = \frac{U}{R}$

Zaporedna vezava kondenzatorjev

$\frac{1}{C} = \sum\frac{1}{C_i}$ $e = e_1 = e_2$

$U = U_1 + U_2$ $U_1 = \frac{e}{c_1}$

Zaporedna vezava uporanikov

$I = I_1 = I_2$

$U = U_1 + U_2$ $R = R_1 + R_2$

$\frac{U_1}{U_2} = \frac{R_1}{R_2}$ $U_1 + U_2 = I(R_1 + R_2) = I*R$

DELO IN ENERGIJA (Meh = Wp&Wk)

$W_k = \frac{mv^2}{2}$

$W_p = mgh$

$W_{pr} = \frac{kx^2}{2}$

$A = Fs\cos\varphi$

$P = \frac{A}{t}$

$A_{Fteže} = -F_g\,h$

Gibalna količina

$\Delta G = F\Delta t$

$G = mv$

1.Neprožni trk: $G_0 = G_1$; $W_{k0} \neq W_{k1}$

1.1 popolnoma neelastičen (se odpeljeta skupaj)

2.Prožni trk: $G_0 = G_1$; $W_{k0} = W_{k1}$

$v_2' = \frac{2m_1}{m_1 + m_2}v$

HIDRODINAMIKA

$F = \rho Sv^2$

$$\rho = \frac{m}{v}$$

$F_{curka} = S*v^2*\rho$

$$\phi_m = \frac{\Delta m}{\Delta t} = \rho\phi_v = \rho * S * v$$

$$\phi_v = \frac{\Delta V}{\Delta t} = S * v$$

$$F_{upora\ tekočine} = \frac{1}{2} C_u * S * \rho * v^2$$

$$p = p_0 + \rho g h$$

$$R = F_g = \rho_{tekocine} * V_{izpodrinjenetek} * g$$

$$F_{telo\ v\ ravnovesju} = (\rho - \rho_{tekocine}) * V * g$$

$$\frac{\rho v_1^2}{2} + \rho g h_1 + p_1 = konst.$$

SOD, Z LUKNJICO

$$p = p_0 + \rho g h$$

$$v = \sqrt{2gh}$$

ZAKONA UPORA

$$F_{upora} = C_u * S * \frac{\rho v^2}{2}$$

$$F_{upora} = 6\pi r * v * \eta$$

NIHANJE

$x = x_0 \sin\omega t$

$v_{max} = x_0\omega_0$

$a_{max} = -x_0\omega_0^2$

$$t_0 = 2\pi\sqrt{\frac{m}{k}}$$ (vzmet)

$$\omega^2 = \frac{g}{l}$$

$$t_0 = 2\pi\sqrt{\frac{l}{g}}$$ (matematično nihalo)

$$t_0 = 2\pi\sqrt{\frac{ml_T^2 + J_T}{mgl}}$$

$$t_0 = \sqrt{\frac{l}{6g}}$$ (palica na koncu)

Kroženje

$$\omega = \frac{\varphi}{t}$$

$$\varphi = \omega t$$

$$a_r = \omega^2 R = \frac{v^2}{R}$$

$$v = \omega R$$

$$\omega = 2\pi\gamma$$

$$t_0 = \frac{t}{N}$$

$$\gamma = \frac{N}{t}$$

$$\gamma = \frac{1}{t_0}$$

Pospešeno kroženje:

$$\omega = \omega_0 + \alpha t$$

$$\varphi = \omega_0 t + \frac{at^2}{2}$$

$$a_t = \alpha R$$

$$a = \sqrt{a_t^2 + a_r^2}$$

$$\alpha = \frac{\omega}{t}$$

$$\varphi_{(t)} = \varphi_0 + \omega_0 t + \frac{\alpha t^2}{2}$$

NAVOR IN VZTRAJNOSTNI MOMENT

M = F sin(alfa) r

A=Mφ

P=Mω

$$W_k = \frac{J\omega^2}{2}$$

$J=mr^2$ (masna točka na koncu vrvi dolžilne r)

$$J = \frac{ml^2}{3}$$ (palica dolžine l, vpeta na koncu)

$$J = \frac{mR^2}{2}$$ (poln valj vpet po osi)

$$J = \frac{2}{5} mR^2$$ (krogla)

$$J = \frac{ml^2}{12}$$ (palica vpeta v težišču)

$$a = \frac{g \sin\varphi}{1 + \frac{J}{mr^2}}$$ (kotaljenje po klancu)

$$J_t \frac{w^2}{2} + \frac{mv_t^2}{2} = mgh$$

$$J * \alpha = M_{zunanjihsil}$$

VRTILNA KOLIČINA

Γ=J*ω=G*r

$$\omega_p = \frac{M}{\Gamma}$$

$$M = \frac{\Delta\Gamma}{\Delta t}$$