Tabeller

Greske bokstaver

Α	α	alfa
Β	β	beta
Γ	γ	gamma
Δ	δ	delta
Ε	ε	epsilon
Ζ	ζ	zeta
Η	η	eta
Θ	θ	theta
Ι	ι	iota
Κ	κ	kappa
Λ	λ	lambda
Μ	μ	my
Ν	ν	ny
Ξ	ξ	ksi
Ο	ο	omikron
Π	π	pi
Ρ	ρ	rho
Σ	σ	sigma
Τ	τ	tau
Υ	υ	ypsilon
Φ	φ	phi
Χ	χ	khi
Ψ	ψ	psi
Ω	ω	omega

Konstanter

Tyngdeakselerasjonen	g	9,80665	m/s^2
Atomær masseenhet	u	$1{,}6605 \cdot 10^{-27}$	kg
Elektronets masse	m_e	$9{,}110 \cdot 10^{-31}$	kg
Elementærladningen	e	$1{,}602 \cdot 10^{-19}$	C
Elektronvolt	eV	$1{,}602 \cdot 10^{-19}$	J
Protonets masse	m_p	$1{,}673 \cdot 10^{-27}$	kg
Nøytronets masse	m_n	$1{,}675 \cdot 10^{-27}$	kg
Lyshastigheten i vakuum	c	$2{,}99792 \cdot 10^{8}$	m/s
Boltzmanns konstant	k	$1{,}381 \cdot 10^{-23}$	J/K
		$8{,}6174 \cdot 10^{-5}$	eV/K
Plancks konstant	h	$6{,}626 \cdot 10^{-34}$	Js
Rydberg-konstanten	$\mathcal{R}$	$1{,}097 \cdot 10^{7}$	m^{-1}
Bohrs konstant	B	$2{,}18 \cdot 10^{-18}$	J
Avogadros tall	N_A	$6{,}022 \cdot 10^{23}$	mol^{-1}
Gasskonstanten	R	8,31451	J/molK
		0,0820578	Latm/molK
Faradaykonstanten	F	96485	C/mol
Gravitasjonskonstanten	γ	$6{,}672 \cdot 10^{-11}$	Nm^2/kg^2
Permeabiliteten for vakuum	μ_0	$1{,}257 \cdot 10^{-12}$	H/m
Permittiviteten for vakuum	ε_0	$8{,}854 \cdot 10^{-12}$	F/m
Elektrisk konstant $=(4\pi\varepsilon_0)^{-1}$	k_e	$9{,}0 \cdot 10^{9}$	Nm^2/C^2
Magnetisk konstant	k_m	$2 \cdot 10^{-7}$	N/A^2
Stefan-Boltzmannkonstanten	σ	$5{,}67 \cdot 10^{-8}$	W/m^2K^4
Wiens konstant	a	$2{,}90 \cdot 10^{-3}$	mK
Volum av 1 mol ideell gass	$V_{m,298K}$	24,4651	L

Formler

Kinetisk energi: Klassisk $E = \frac{1}{2}mv^2$ Einstein: $E = mc^2$

Gravitasjon: $F = \frac{\gamma m_1 m_2}{r^2}$ $F = gm$ Magnetisk: $F = qvB$. $\varepsilon = lvB$

Elektrisk: $F = \frac{k_e q_1 q_2}{r^2} = \frac{q_1 q_2}{4\pi\varepsilon_0 r^2}$ $E_p = \frac{k_e Qq}{r}$ Transformator: $\frac{U_s}{U_p} = \frac{N_s}{N_p}$

Stråling: $\lambda_m = \frac{a}{T}$ $M_e = \sigma T^4$ $E_k = hf - W$ $\lambda = \frac{h}{mv}$

Lukket system: $\Delta U = q + w$ Bare volumarbeid, konstant trykk: $w = -P\Delta V$.

Entalpi $\Delta H = q_P$ $\Delta H = n\int_{T_1}^{T_2} C_P dT$ $\Delta H = n\overline{C_P}\Delta T$

Entropi: $S = k \ln W$ $\Delta S = \int_1^2 \frac{dq_{rev}}{T} \approx \frac{\Delta q_{rev}}{T} \overset{Konst.trykk}{=} \frac{\Delta H}{T}$

$\Delta U = q_{rev} + w_{rev} = q_{irrev} + w_{irrev}$ Ideell gass: $PV = nRT$

Gibbs energi: $G = H - TS$ Frivillig prosess: $\Delta G = \Delta H - T\Delta S < 0$

$\Delta_r G = \Delta_r G^0 + RT \ln Q \overset{eksempel}{=} \Delta_r G^0 + RT \ln \frac{a_C^c a_D^d}{a_A^a a_B^b}$

$w_{el} = \Delta G = -nFE$ $\Delta G^0 = -nFE^0$ Nernst: $E = E^0 - \frac{RT}{nF} \ln Q$

Likevekt: $\Delta_r G^0 = -RT \ln Q_{likevekt} = -RT \ln K$ $E^0 = \frac{RT}{nF} \ln Q_{likevekt} = \frac{RT}{nF} \ln K$

$\Delta_r H^0 = \sum_{\text{produkter}} \Delta_f H^0 - \sum_{\text{reaktanter}} \Delta_f H^0$ $\Delta_r S^0 = \sum_{\text{produkter}} S^0 - \sum_{\text{reaktanter}} S^0$

$\Delta_r G = \sum_{\text{produkter}} G - \sum_{\text{reaktanter}} G$

$pH = -log[H^+]$ $pK_a = -logK_a$ Buffer: $pH = pK_a + \log \frac{[B]}{[A]}$

Gitter $E_L = N_A k_e e^2 \frac{z_C z_A}{d_{eq}} \left(1 - \frac{d^*}{d_{eq}}\right) A$ Hydr.: $E_{hyd} = -\left(K_C \frac{z_C^2}{r_C} + K_A \frac{z_A^2}{r_A}\right)$

Vektarmregelen: $m_1(q - a_1) = m_2(a_2 - q)$

Bragg: $n\lambda = 2d \sin\theta$ $d_{hkl} = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$

Selvdiffusjon: $D_r = D_r^0 e^{-Q_D/RT}$, $d_{r,total} = \frac{6D_r t}{d}$, $r_{r,radiell} = \sqrt{6D_r t}$, $r_x = \sqrt{2D_r t}$

$$D_{r,defekt}[defekt] = D_{r,s}[s]$$

$$\vec{v} = B\vec{F} \qquad D_r = kTB \quad u = zeB \quad \sigma = zecu \quad \sigma_s = z_s e c_s u_s = z_s e c_{s,defekt} u_{s,defekt}$$

Fluks: $\vec{j} = c\vec{v} = cB\vec{F} = \frac{cD_r}{kT}\vec{F}$ Elektrokjemisk Felt: $F = -(\frac{d\mu}{dx} + ze\frac{d\phi}{dx}) = -\frac{d\eta}{dx}$

Strøm og ladning: $I = \frac{q}{t}$

Ledningsevne: $G = \sigma\frac{a}{d}$ $G = \frac{1}{R}$ Ohms lov: $i = \sigma E$ $\mathrm{I} = \frac{\mathrm{U}}{R}$

Effekt: $P = UI$ Virkningsgrad: $\eta_{total} = \eta_{Gibbs}\eta_{Faraday} = \eta_{Gibbs}u_{fuel} = \frac{P_e}{P_{in}}$

Mekanisk: $\vec{\sigma} = \frac{\vec{F}}{A}$ $\varepsilon = \frac{\Delta l}{l}$ $\sigma = E\varepsilon$ Polymer: $\sigma_B \approx \sigma_{B,\max} - \frac{A}{M}$ Lyd:

$$v = \sqrt{\frac{E}{\rho}}$$

Snell: $\frac{\sin i}{\sin r} = \frac{v_i}{v_r}$ Magnetisk: $\vec{B} = \mu\vec{H} = \mu_0\vec{H} + \mu_0\vec{M} = \mu_0(\vec{H} + \vec{M}) = \mu_0\vec{H}(1+\chi)$

Periodesystemet

PERIODIC CHART OF THE ELEMENTS

IA	IIA	IIIB	IVB	VB	VIB	VIIB	VIII			IB	IIB	IIIA	IVA	VA	VIA	VIIA	INERT GASES
1 H 1.00797																1 H 1.00797	2 He 4.0026
3 Li 6.939	4 Be 9.0122											5 B 10.811	6 C 12.0112	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.183
11 Na 22.9898	12 Mg 24.312											13 Al 26.9815	14 Si 28.086	15 P 30.9738	16 S 32.064	17 Cl 35.453	18 Ar 39.948
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.9216	34 Se 78.96	35 Br 79.909	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc (99)	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.904	54 Xe 131.30
55 Cs 132.905	56 Ba 137.34	*57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59	81 Tl 204.37	82 Pb 207.19	83 Bi 208.980	84 Po (210)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)	†89 Ac (227)	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (262)	108 Hs (265)	109 Mt (266)	110 ? (271)	111 ? (272)	112 ? (277)						

Numbers in parenthesis are mass numbers of most stable or most common isotope.

Atomic weights corrected to conform to the 1963 values of the Commission on Atomic Weights.

The group designations used here are the former Chemical Abstract Service numbers.

*Lanthanide Series

58 Ce 140.12	59 Pr 140.907	60 Nd 144.24	61 Pm (147)	62 Sm 150.35	63 Eu 151.96	64 Gd 157.25	65 Tb 158.924	66 Dy 162.50	67 Ho 164.930	68 Er 167.26	69 Tm 168.934	70 Yb 173.04	71 Lu 174.97

†Actinide Series

90 Th 232.038	91 Pa (231)	92 U 238.03	93 Np (237)	94 Pu (242)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (249)	99 Es (254)	100 Fm (253)	101 Md (256)	102 No (256)	103 Lr (257)