Chemical formulas

Name	Chemical formula
Average atomic mass of an element	mat=(mat1 · p1% + mat2 p2% + ...) / 100%
	mat - atomic mass of an element [u] mat1, mat2 - atomic masses of particular isotopes [u] p1%,p2% - percentage content of individual isotopes [%]
Percent concentration	Cp = (ms/mr) · 100% msol = msolv + ms
	Cp - percent concentration [%] msol - mass of solution [g] ms - mass of substance [g] msolv - mass of solvent [g]
Absolute density	d=m/V
	d - density [kg/m^3] m - mass [kg] V - volume [m^3]
Ion product of water	$[H^+] \cdot [OH^-]=10^{-14}$ pH+pOH=14
	$[H^+]$- concentration of hydrogen ions [mol/dm^3] $[OH^-]$ - concentration of hydroxide ions [mol/dm^3] pH - negative logarithm of the concentration of hydrogen ions pOH - negative logarithm of the concentration of hydroxide ions
Moles	n=ms/M n=V/Vmol n=N/NA
	n - moles [mol] ms - mass of solute [g] M - molar mass [g/mol] V - gas volume [dm^3] Vmol - molar volume of gas [dm^3/mol] N - particles (molecules, atoms, electrons) NA - Avogadro's number NA=$6.022\ 10^{23}$ [particles/mol] or [1 mol]
Molar concentration	cm=n/Vr=(ms · dr)/(M · mr)
	cm - molar concentration [mol/dm^3] n - moles [mol] M - molar mass [g/mol] mr - solution mass [g] Vr - solution volume [dm^3] dr - solution density [g/dm^3]
pH of solution	$pH=-\log[H^+]$ $[H^+]=10^{-pH}$ $[OH^-]=10^{-pOH}$
	pH - negative logarithm of the concentration of hydrogen ions $[H^+]$ - concentration of hydrogen ions [mol/dm^3] $[OH^-]$ - concentration of hydroxide ions [mol/dm^3]
Equilibrium constant for the $xA+yB \leftrightarrows mC+nD$ process	K=[C]m · [D]n/[A]x · [B]y
	[A],[B],[C],[D] - molar concentrations of reagents in equilibrium [mol/dm^3] x, y, m, n - coefficients from the reaction equation

CHEMICAL ACADEMY

Chemical formulas

PCC Group

Name	Chemical formula
Clapeyron equation	$pV=nRT$
	p - gas pressure [Pa] n - moles[mol] R - gas constant R=8,31 Jmol · K V - gas volume [m^3] T - gas temperature [K]
Dissociation constant for monoprotic acid dissociating according to the following equation: $HA \leftrightarrows H^+ + A^-$	$Ka=[H^+][A^-]/[HA]$
	Ka - dissociation constant (equilibrium constant of the dissociation reaction) [H^+] - molar concentration of hydrogen ions formed during dissociation, measured after the establishment of the equilibrium state [mol/dm^3] [A^-] - molar concentration of acid residue ions formed during dissociation, measured after the establishment of the equilibrium state [mol/dm^3] [HA] - concentration of undissociated acid molecules measured after the establishment of the equilibrium state [mol/dm^3]
Law of dilution	$K=(\alpha^2 \cdot Co)/(1-\alpha)$
	K - dissociation constant α - dissociation degree expressed as a decimal fraction Co - initial concentration [mol/dm^3]
Law of dilution for weak electrolytes	$K=(\alpha^2 \cdot Co)/(1-\alpha)$, where: $(1-\alpha) \approx 1$ $K=\alpha^2 \cdot Co$
	K - dissociation constant α- dissociation degree expressed as a decimal fraction Co - initial concentration [mol/dm^3]
Dissociation degree	α= ndis/nintr lub α= Cdis/Cintr It can also be reported as a percentage then: α=(ndis/nintr) · 100% or α=(Cdis/Cintr) · 100%
	α - dissociation degree (as a dimensionless number or in [%]) ndis - moles of molecules dissociated into ions [mol] nintr - total moles of molecules introduced into the solution [mol] Cdis - concentration of molecules dissociated into ions [mol/dm3] Cintr - concentration of molecules introduced into the solution [mol/dm3]

Visit the PCC Group Chemical Academy available at www.products.pcc.eu