

General Chemistry formula sheet

Prefix	Symbol	Factor
Giga	G	10^9
Mega	M	10^6
Kilo	K	10^3
centi	C	10^{-2}
milli	m	10^{-3}
micro	μ	10^{-6}
nano	n	10^{-9}
$1 \text{ mol} = 6.022 \times 10^{23} \text{ molecules}$ $1 \text{ cm}^3 = 1 \text{ mL}$		

Name	Formula	Name	Formula
Acetate	$\text{C}_2\text{H}_3\text{O}_2^-$	Phosphate	PO_4^{3-}
Carbonate	CO_3^{2-}	Ammonium	NH_4^+
Bicarbonate	HCO_3^-	Chlorite	ClO_2^-
Hydroxide	OH^-	Chlorate	ClO_3^-
Nitrite	NO_2^-	Sulfite	SO_3^{2-}
Nitrate	NO_3^-	Sulfate	SO_4^{2-}
Cyanide	CN^-		

$$\begin{aligned}
 \text{Density} &= \frac{\text{mass}}{\text{volume}} & M &= \frac{\text{mol solute}}{\text{L solution}} & M_1V_1 &= M_2V_2 \\
 \frac{P_1V_1}{T_1} &= \frac{P_2V_2}{T_2} & PV &= nRT & \chi_A &= \frac{\text{mol A}}{\text{total mol}} \\
 P_A &= \chi_A * P_{\text{total}} & q &= mc\Delta T & q &= n\Delta H \\
 c &= \lambda\nu & \Delta H^\circ_{\text{rxn}} &= \sum n_p \Delta H^\circ_f - \sum n_r \Delta H^\circ_f & & \\
 & & FC &= \# \text{ of valance } e^- - [\# \text{ of lone pairs} + \# \text{ of bonds}] & &
 \end{aligned}$$

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$$\ln \frac{P_2}{P_1} = \frac{-\Delta H_{vap}}{R} \left(\frac{1}{T_2} - \frac{1}{T_1} \right)$$

$$\Delta T_b = imK_b$$

$$pH + pOH = 14$$

$$pK_a = -\log K_a$$

$$m = \frac{\text{mol solute}}{\text{kg Solvent}}$$

$$\text{rate} = k[A]^n[B]^m$$

$$pH = -\log[H_3O^+]$$

$$pH = pK_a + \log \frac{[base]}{[acid]}$$

$$\Delta T_f = imK_f$$

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$$pOH = -\log[OH^-]$$

$$\Delta G^\circ = -nFE^\circ_{cell}$$

Order	Rate law	Integrated rate law	Half-life
0	$\text{rate} = k[A]^0$	$[A]_t = [A]_0 - kt$	$t_{\frac{1}{2}} = \frac{[A]_0}{2k}$
1	$\text{rate} = k[A]^1$	$\ln[A]_t = \ln[A]_0 - kt$	$t_{\frac{1}{2}} = \frac{\ln 2}{k}$
2	$\text{rate} = k[A]^2$	$\frac{1}{[A]_t} = \frac{1}{[A]_0} + kt$	$t_{\frac{1}{2}} = \frac{1}{k[A]_0}$

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