This TWO PAGE reference sheet has been made available to you for use on assessments (automated and written). However, you may NOT add notes or other information to this document.

$PV = nRT$ $P_1V_1 / T_1 = P_2V_2 / T_2$ $P_{Total} = P_1 + P_2 + P_3 + ...$

$S_1 / P_1 = S_2 / P_2$ M = mol solute / L solution m = mol solute / kg solvent

$\Delta T_f = k_f \times m$ … include mole factor $\Delta T_b = k_b \times m$ … include mole factor $M_1V_1 = M_2V_2$ … include mole factor

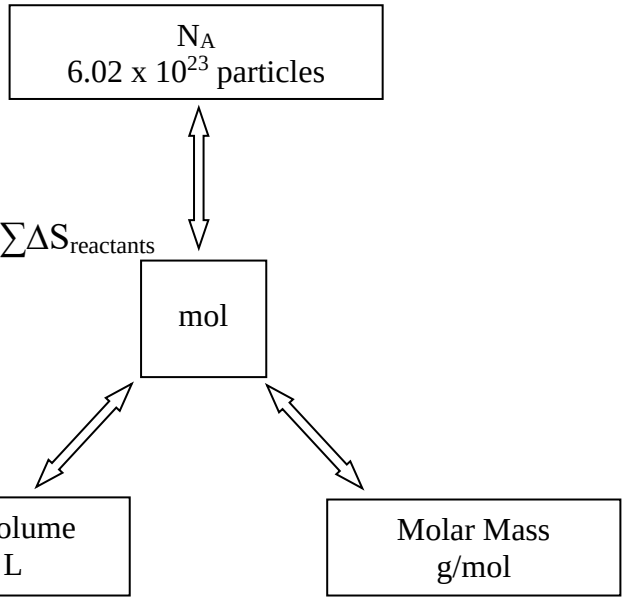
$q = mc\Delta T$ $\Delta T = T_{Final} - T_{Initial}$ $C_{water} = 4.18$ J/(g· ^{0}C) = 1 cal/ g· ^{0}C

$q = m\Delta H_f$ $q = m\Delta H_v$ $\Delta H = \sum\Delta H_{products} - \sum\Delta H_{reactants}$

ΔH^0 = sum of [($\Delta H_f{}^0$ of products) × (mol of products)] – sum of [($\Delta H_f{}^0$ of reactants) × (mol of reactants)]

% volume = volume solute/volume solution x 100% % mass = mass solute/mass solution x 100%

% yield = actual yield/theoretical yield x 100%



$aA + bB \rightarrow cC + dD$ $K_{eq} = [Products]^p / [Reactants]^r$

$K_{eq} = [C]^c \times [D]^d / [A]^a \times [B]^b$ $K_{sp} = [C]^c \times [D]^d$

$\Delta G = \Delta H - T\Delta S$ $\Delta G_{rxn} = \sum\Delta G_{products} - \sum\Delta G_{reactants}$ $\Delta S_{rxn} = \sum\Delta S_{products} - \sum\Delta S_{reactants}$

$K_w = [H^+][OH^-] = 1 \times 10^{-14}$ at 25 ºC

$pH + pOH = 14$ $K_a = [H^+][X^-] / [HX]$

$pH = -\log_{10}[H^+]$ $pOH = -\log_{10}[(OH)^-]$

Oxid.: $2\ M^0 \rightarrow 2\ M^{+1} + 2\ e^-$ Red.: $X^0 + 2\ e^- \rightarrow X^{-2}$

$E^0{}_{cell} = E^0{}_{oxid} + E^0{}_{red}$

Law of Definite (fixed) proportions: mass of element 1: mass of element 2 in a compound is constant

Law of Conservation of Mass: the sum of the mass(es) of the reactant(s) equals the sum of the mass(es) of the product(s).

Factor Labelling: equalities become conversion factors (e.g. 1 cm^3 = 1 ml → 1 cm^3 / 1 ml or 1 ml / 1 cm^3)
(e.g. 1 atm = 101.3 kPa → 1 atm / 101.3 kPa or 101.3 kPa / 1 atm)

% error = |(Accepted – Experimental)|/Accepted x 100%

Relative Abundance: Sum of the (% abundance x Atomic mass) of each isotope = 100 %

Density = mass/volume C = K – 273 K = C + 273

$E = h\nu$ $c = f\lambda$ $E = hc/\lambda$ → E = hν combined with $\nu = c/\lambda$

$h = 6.626 \times 10^{-34}\ J{\cdot}s$ $c = 2.998 \times 10^{8}\ m/s$

"AGES"

A → What is the problem **ASKING** for? [*Highlight this in the question. This is the destination.*]

G → What are you **GIVEN** (information)? [*Label all amounts/variables given. This is the starting point.*]

E → What **EQUATION** should be used? [*Write the equation/formula needed. This is the map.*}

S → **SOLVE** *the problem by plugging in measurements with units*. Does it makes SENSE?