Equations and Conversions

Ideal Gas Constant: $R = 8.314\ J\ K^{-1}\ mol^{-1} = 0.08206\ L\ atm\ mol^{-1}\ K^{-1}$

Compressibility, $Z = \frac{PV}{nRT}$ $\quad PV = nRT$ $\quad \left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$

Pressure conversions: $1\ atm = 1.01325 \times 10^5\ Pa = 760\ mm\ Hg = 760\ torr$

$q = nC\Delta T$ $\quad w = Fd = -P_{ext}\Delta V$

$\Delta E = q + w$ $\quad \Delta E = nC_v\Delta T = q_v$

$\Delta H = \Delta E + P\Delta V$ $\quad \Delta H = nC_p\Delta T = q_P$ $\quad q = n\Delta H_{fus/vap}$ $\quad \Delta H_{rxn} = \Delta H_{pdt} - \Delta H_{rct}$

$\Delta T_f = K_f c_m$ $\quad \Delta T_b = K_b c_m$