Formula Sheet:

gasses

$V \propto \frac{1}{P}$

$V \alpha n$

$V \alpha T$

$P_{total} = P_1 + P_2 + ...$

$PV = nRT$

$$\left(P + \frac{n^2 a}{V^2} \right) \cdot (V - nb) = nRT$$

$$\frac{\text{rate}_A}{\text{rate}_B} = \frac{\bar{u}_A}{\bar{u}_B} = \frac{\sqrt{M_{mB}}}{\sqrt{M_{mA}}}$$

$$\bar{u} = \sqrt{\frac{3RT}{M_m}}$$

thermochemistry

$q = s\, m\, \Delta T$

$q = C_p\, \Delta T$

$\Delta H = q_p = \Delta E + P\Delta V$

general

$E = h\nu\ (= hf)$

$c = \lambda\nu\ (= \lambda f)$

$$\overline{E}_k = \frac{1}{2} m \bar{u}^2$$

constants:

R = 0.08206 L atm/(mol K) = 8.315 kPa dm^3/(mol K) = 8.315 J/(mol K) = 62.36 Torr L/(mol K)

1.000 atm = 760. Torr = 101.3 kPa

$N_A = 6.022 \times 10^{23}\ mol^{-1}$

$c = 2.998 \times 10^8$ m/s

$h = 6.626 \times 10^{-34}$ J s

STP = 1.0000 atm pressure and 273.15 K

specific heat of water (s) = 4.18 J °C^{-1} g^{-1}

kilo = 10^3

centi = 10^{-2}

milli = 10^{-3}

nano = 10^{-9}

pico = 10^{-12}