THINGS TO REMEMBER WHEN SOLVING GAS PHASE EQUILIBRIUM PROBLEMS

I Be able to write equilibrium expressions in terms of <u>pressure</u> (use variable P for pressure with subscripts for the gas) and <u>concentration</u> (use [brackets] for concentration with the formula).

II If the problem involves gases along with solids (or true liquids, for that matter) DO NOT write these into the equilibrium expression. <u>Solids and true liquids</u> (like pure water, liquid bromine, mercury, etc) <u>do not appear in the equilibrium expressions</u>.

III Be able to calculate K_P and K_C from equilibrium partial pressures or concentrations that are given to you. Remember that K_P and K_C <u>have no units</u>.

IV The 'Ideal Gas Law Moment'

Be able to use PV = nRT. Remember that you can switch from concentration (molarity) of a gas to partial pressure of a gas:

$$P = \left(\frac{n}{V}\right)RT \qquad \text{so} \qquad P = MRT$$

V Be able to switch from K_P to K_C. Remember to use the formulas:

$$K_P = K_C(RT)^{\Delta n} \qquad \text{and} \qquad K_C = K_P(RT)^{-\Delta n}$$

(where Δn = moles of gas products minus moles of gas reactants)

When you use these formulas just drop the units on 'R' (don't forget that you want to use 0.0821) and 'T' (in Kelvins). And be careful (and not stupid), the only formula on the formula sheet is the K_P formula. And be careful of which formula has the minus sign.

VI And don't forget your molarity and mole fraction calculations!

$$M = \text{mol/L}$$

$$X_{component} = \text{moles}_{component}/\text{moles}_{total}$$

VII And you can use mole fraction to calculate partial pressure:

$$P_{component} = X_{component} \cdot P_{total}$$