**Acid and bases revision**

11) When the concentration of the reactants and the products remain constant equilibrium is reached.

12) i) a strong acid is one which ionizes completely when dissolved in water. A Weak acid does not ionize completely when dissolved in water.

 ii) A concentrated solution is one which has a high concentration of solute to solvent. A dilute solution has a low concentration of solute to solvent.

13) Le Chatelier’s Principle states that if a stress is place on a reaction in equilibrium the position of the equilibrium will change to relieve the stress.

14) Keq = [C]3[D]2

 [A]2[B]2

 [A] = 2mol L-1

 [B] = 3 mol L-1

 [C] = 3 mol L-1

 [D] = 1 mol L-1

Keq = 33 x 12

 22 x 32

= 27/36

 =0.75

 = 7.5 x 10-1

15) C(s) + NO2 (g) ↔ CO(g) + NO (g) ΔH = -53.5 kJ mol-1

a) If volume increases then pressure decreases therefore the side which restores/increases pressure will be favoured. If the number of molecules increases then the pressure will increase therefore the forward reaction is favoured and more CO and NO will be produced.

b) If CO concentration is reduced then the equilibrium will shift to the left to restore the equilibrium.

5) as ΔH is –ve the reaction is exothermic so if temperature is increased the side which reduces the temperature will be favoured to restore the equilibrium. Therefore the reverse reaction will be favoured.

16) Keq = [CO][NO]

 [NO2]

C is not included in Keq as it Is a solid.

17) i) Molar mass of KOH = 39g + 16g + 1g

 = 56g

No of moles KOH = 2.8g/56g

 = 0.05 moles

Molarity = moles/L

 = 0.05moles/0.5L

 [OH] = 0.1M

ii) pOH = -log[OH]

 = -log[0.1]

 = 1

pH = 14 – pOH

 = 14 – 1

 = 13

18) pH = pKa + log(C2H3OO-/C2H3OOH)

pKa = -log(1.8 x 10-5)

= 4.74

Moles of C2H3OO- = Moles of C2H3OOH = 0.1M x 0.5L (assume that C2H3OOH dissociates poorly)

 = 0.05moles

pH = 4.74 + log (0.05moles/0.05moles)

 = 4.74 + 0

 = 4.74

19) Ka = [H+] [ClO-] Ka = 3.0 x 10-8

 [HClO] [HClO] = 2M

Therefore 3.0 x 10-8 = C x C

 2M

 6.0 x 10-8  =C2

 C = 2.4 x 10-4 = [H+]

pH = -log ( 2.4 x 10-4)

 = 3.62

pOH = 14 – 3.62

 = 10.38

Therefore [OH-] = 10-10.38

 = 4.17 x 10-11

20) 2NO2(g) ↔ 2NO(g)  + O2(g)

Initial 8 mol/L 0mol/L 0 mol/L

Final (8-2)mol/L 2 mol/L 1mol/L

Keq = [NO]2[O2]/NO2]2

=22x 1/62

 = 4/36

 = 1.11 x 10-1