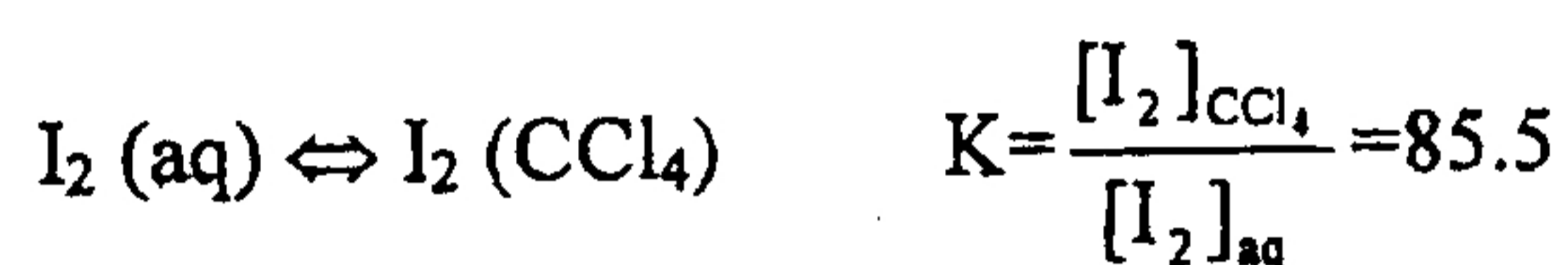


- Please define the following terms (20%, 4 % for each).
 - Extensive and Intensive property
 - Random error
 - Law of conservation of mass
 - Oxidation state
 - Polyatomic ion
- Balance the following equations (20%, 5% for each).
 - $\text{SiCl}_4(l) + \text{H}_2\text{O}(l) \rightarrow \text{SiO}_2(s) + \text{HCl}(g)$
 - $\text{Na}_2\text{HPO}_4(s) \rightarrow \text{Na}_4\text{P}_2\text{O}_7(s) + \text{H}_2\text{O}(l)$
 - $\text{P}_2\text{H}_4(l) \rightarrow \text{PH}_3(g) + \text{P}_4(s)$
 - $\text{S}_2\text{Cl}_2 + \text{NH}_3 \rightarrow \text{N}_4\text{S}_4 + \text{NH}_4\text{Cl} + \text{S}_8$
- Calculating the pH changes in a buffer solution: what is the effect on the pH of adding (a) 0.0060 mol HCl and (b) 0.000 mol NaOH to 0.300L of a buffer solution that is 0.250 M $\text{HC}_2\text{H}_3\text{O}_2$ and 0.560 M $\text{NaC}_2\text{H}_3\text{O}_2$ (20%).
- The concentration of a saturated solution of I_2 in water is 1.33×10^{-3} M. Also,



A 10.0 mL sample of saturated $\text{I}_2(\text{aq})$ is shaken with 10.0 mL CCl_4 . After equilibrium is established, the two liquid layers are separated.

- What mass of I_2 , in mg, remains in the water layer?
 - If the 10.0 mL water layer in (a) is extracted with a second 10.0 mL portion of CCl_4 , what will be the mass, in mg, of I_2 remaining in the water?
 - If the 10.0 mL sample of saturated $\text{I}_2(\text{aq})$ had originally been extracted with 20.0 mL CCl_4 , would the quantity of I_2 remaining in the aqueous solution have been less than, equal to, or greater than in part (b)? Explain (20%).
- Draw a structure to correspond to each of the following names (10%, 2 % for each).
 - isopropyl methyl ether
 - cyclohexane
 - 2-butanol
 - propionaldehyde
 - diethylmethanamine
 - Indicate why each of these names is incorrect and give a correct name (10%, 2 % for each).
 - 3-pentene
 - 1-propanone
 - 2,6-dichlorobenzene
 - 2-methyl-4-butyl-octane
 - 4,4-dimethyl-5-ethyl-1-hexyne