# **Chem Lab Q&A**

## Colorimetry

1. Define Beer-Lambert's law.   
     
   “given material’s sample path length & conc of the sample are ∝ to the absorbance of light.”
2. Write an expression for Beer-Lambert's law.   
     
      
     
   **A** = amount of light absorbed for a particular wavelength by the sample

**ε** = molar extinction coefficient

**L** = distance covered by the light through the solution

**c** = concentration of the absorbing species

1. In the colorimetric estimation of copper, the following data is obtained. Calculate the amount of copper in the unknown solution. Unknown volume = 5.5 cm'. Amount of copper sulphate present in 250 cm of stock solution = 4g. (Molecular weight of copper (II) sulfate pentahydrate = 249, Atomic weight of copper = 64)  
     
   **[NUMERICAL]**
2. What is the necessity of blank solution in colorimetry?   
     
   Used as reference value before measuring unknown & std values for better accuracy”
3. Absorbance vs concentration plot is straight line in colorimetry. Justify.  
     
   According to Beer-lambert law, absorbance ∝ conc. More conc = more light absorbed
4. Why is ammonia added in the colorimetric estimation of copper?   
     
   Ammonia is added to the solution to form an intense blue color which is used to test for absorbance of solution and hence measure copper in solution.
5. 1 cm3 of copper sulphate solution contains 0.35 g of copper sulfate. What is the amount of copper present in 10 cm3 of the same solution?  
     
   **[NUMERICAL]**
6. Name the complex formed in the colorimetric estimation of copper.   
     
   Deep blue cuprammonium [Cu(NH3)4]2+ complex ion is formed.
7. Why colorimetric estimation of copper is done at 620 nm?   
     
   The complex shows maximum absorbance at 620nm wavelength
8. How do you estimate iron quantitatively by colorimetric method?  
     
   **[IDK]**

## pKa

1. What is pKa? Give cell representation of the electrochemical cell set up in the estimation of pKa.   
     
   measure of acidity of a solution OR -ve log of acid disassociation constant (Ka)
2. Which is the indicator electrode used in the estimation of pKa? Why is it called so?
3. Name two electrodes required to determine pH of any solution.
4. How do you relate pH and pKa?
5. What is dissociation constant?
6. Write Henderson-Hasselbalch equation
7. What is a glass electrode? Write the cell representation of glass electrode.  
     
   glass electrode : Ion selective electrode used to find pH of a solution.   
   cell rep of glass electrode:
8. What is a buffer solution? Name the buffer formed during pKa experiment.   
     
   acid/base aqueous solution that contains weak acid + conjugate base which resists pH change.   
   pH buffer formed
9. Give an example each for weak acid, strong acid, weak base, and strong base.
10. Account for the sudden jump in pH at equivalence point  
      
    sudden jump in pH at equivalent point indicates neutralization of solution.