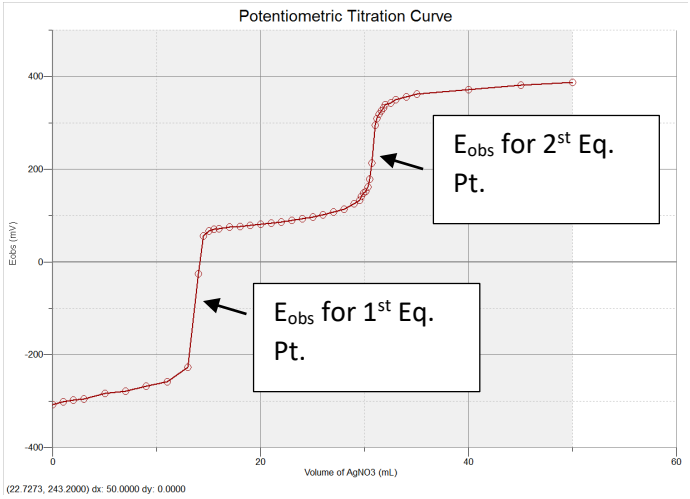
Potentiometric Titrations calculations.



The original E_{obs} is the value recorded with the silver wire and the reference electrode in the 0.070 M $AgNO_3$ solution and is used to calculate E_{ref}.

*Note there are three E_{obs} values to be used in the calculations at various times.

1. Use your titration curve to determine the two equivalence points and to find the I^- and Cl^- concentrations in your unknown samples. Note: The E_{obs} values to be used in K_{sp} calculations are also determined at these points. The equivalence points can be more accurately determined by the first and/or second derivatives.

2. E^o = 0.80 V. E_{ind} must be determined using the formula: $E_{ind} = E^o - \frac{RT}{nF}\ln[Q]$ Where Q = 1/[Ag^+] ([Ag^+]=0.070 M in your case), R = 8.314 J/mol·K, n = 1, F = 9.65 x 10^4 C/mole of e^-.

3. Use E_{ind} and your E_{obs} value (the reading you got with the silver wire and the reference electrode and the standard 0.070 M $AgNO_3$ solution) in the formula: $E_{ind} - E_{obs} = E_{ref}$ to calculate E_{ref}.

4. Now use the formula (Nerst Equation): $[Ag^+] = e^{\left[\frac{nF}{RT}(E_{obs}+E_{ref}-E^o\right]}$ to determine [Ag^+]. The E_{obs} in this equation is the potential at the equivalence point and E_{ref} is the value determined in number 3.

5. Then, since [Ag^+] = [I^-] for AgI at the equivalence point, the K_{sp} of AgI is equal to [Ag^+]^2.

6. Repeat the calculations done in 4 and 5 for AgCl using the E_{obs} from the 2nd equivalence point to determine the experimental Ksp of AgCl.

7. Look up the accepted values of the two Ksp's and compare them to you values.

8. When finished, you should be reporting four items: [Cl^{1-}], [I^{1-}], K_{sp} of AgCl, and K_{sp} of AgI.