

Name: _____
Blk: _____ Date: _____

Chemistry 12
Solubility Lesson # 8
Chloride Titrations

Recall from Unit V + Chem 11:

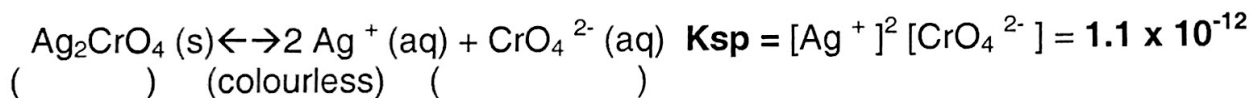
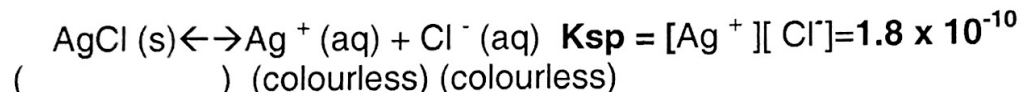
A Titration is _____

_____.

The purpose of carrying out a TITRATION is to _____
of an unknown substance.

For SILVER-CHLORIDE TITRATIONS the _____ is used as an indicator.

WHY?



When unknown $[\text{Ag}^+](\text{aq})$ is slowly added into a beaker containing both 0.10 M $\text{Cl}^- (\text{aq})$ and 0.10 M $\text{CrO}_4^{2-} (\text{aq})$. What will the first ppt to form be?

Re-arrange the above K_{sp} expressions and Solve for $[\text{Ag}^+]$:

The first ppt to form will be _____ as it requires a SMALLER $[\text{Ag}^+]$.
As more and more Ag^+ is added to the beaker the Cl^- is eventually all used up, and at that point the CrO_4^{2-} will begin to combine with the Ag^+ and there will be a distinctive _____ colour produced as _____ is formed. At this point the titration is **STOPPED**.

AT THIS POINT THE MOLES OF Ag^+ ADDED = MOLES OF Cl^- PRESENT

IN SUMMARY: _____

_____.

Example 1. In order to find the $[\text{Cl}^-]$ in a sample of sea water, a 25.0 mL sample was titrated with 0.500 M AgNO_3 solution, using sodium chromate as an indicator. At the EQUIVALENCE POINT 26.8 mL of AgNO_3 had been added. What was the $[\text{Cl}^-]$ in the sea water?

Step 1. Balanced equation

Step 2. Solve for moles of KNOWN

Step 3 .Convert to moles of UNKNOWN

Step 4 .Solve for [] of UNKNOWN

Example 2. What volume of 0.125 M AgNO_3 will be required to titrate 50.0 mL of 0.0500 M Cl^- solution, using the chromate indicator?

Step 1. Balanced equation

Step 2. Solve for moles of KNOWN

Step 3.Convert to moles of UNKNOWN

Step 4. Solve for volume of UNKNOWN

Sample Problem. A 5.29 g sample of impure NaCl was dissolved and diluted to at total volume of 250.0 mL. If 25.0 mL of the NaCl solution required 28.5 mL of 0.300 M AgNO_3 solution to reach the equivalence point, using the chromate indicator, what was the percentage purity of the original NaCl solution?

Recall Percent Purity = actual /expected x 100 %

Seatwork/Homework: Exercises 70-75 pgs 101-102

PLO's: I7