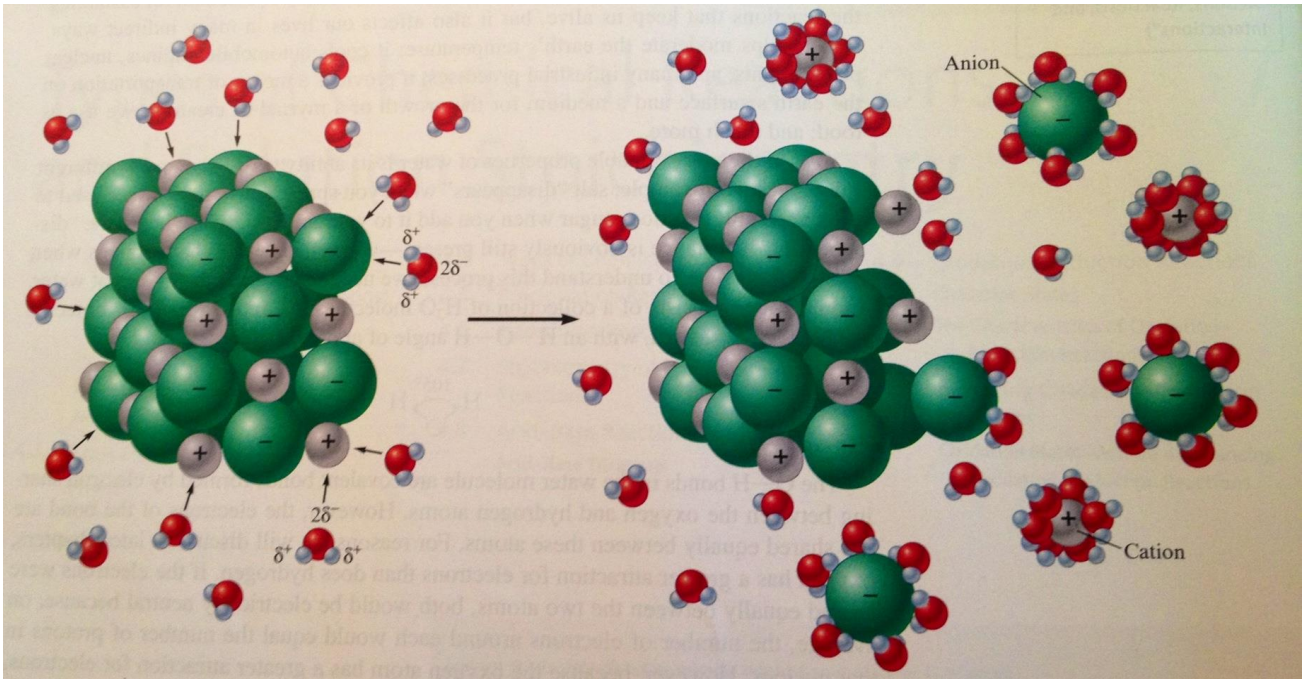
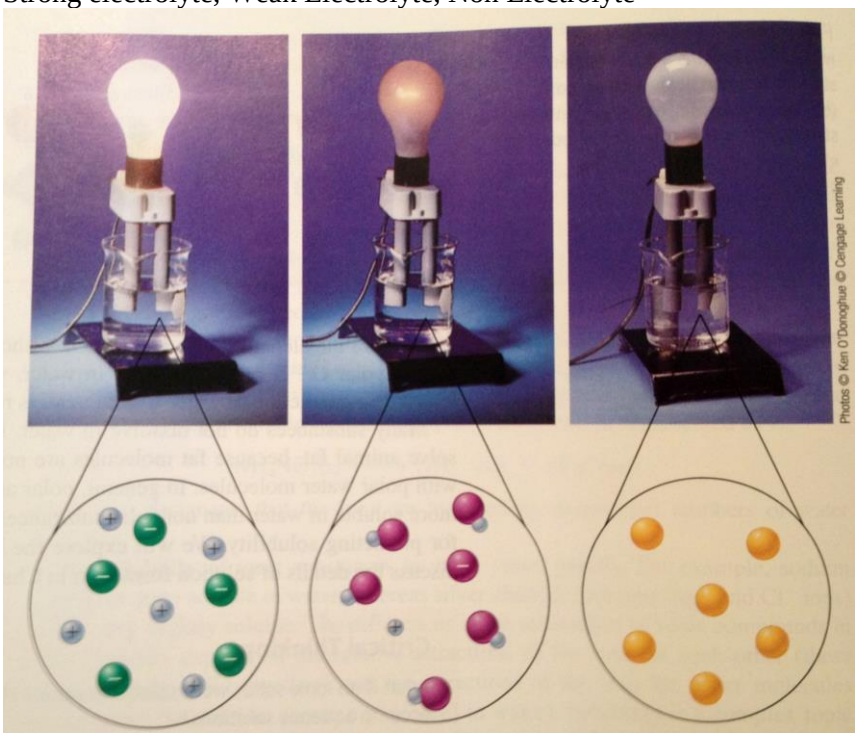
Water…..the common solvent



Practice drawing the scenario above…..water dissolving an ionic solid!

Strong electrolyte, Weak Electrolyte, Non Electrolyte



Electrolytes

1. List whether each of the following is a strong, weak, or nonelectrolyte. If it is strong, write the dissociation equations.

a. $HClO_4$

b. C_6H_{12}

c. LiOH

d. NH_3

e. NaCl

f. $HC_2H_3O_2$

g. NH_4Cl

Molarity

2. Calculate the molarity of a solution contain 0.875 mole NaCl in 1 liter? in 500 ml; in 100 ml; in 6 liters?

3. How would you prepare 500.00 mL of a 0.0500 M solution of $Cu(NO_3)_2$?

4. Calculate the volume of 0.500 M $Cu(NO_3)_2$ needed to prepare 250 mLs of a 0.0400 M $Cu(NO_3)_2$ solution.

5. Determine the molarity of total ions in a solution prepared by dissolving 9.82 g of $CuCl_2$ in enough water to make 600. mL of solutions. What is the molarity of chloride ions?

Precipitation Reactions and Net Ionic Equations:

SOLUBILITY RULES:

1. **Most alkali metal salts AND NH_4^+ salts ARE *soluble***
2. Cl^-, Br^-, I^- are *soluble*, *except for Ag^+, Hg_2^{+2}, Pb^{+2}
3. F^- are *soluble*, *except for IIA metals
4. **NO_3^-**, ClO_3^-, ClO_4^-, and **CH_3COO^- are *soluble***
5. SO_4^{-2} are *soluble*, *except for Ca^{2+}, Sr^{+2}, Ba^{+2}, Ag^+, Pb^{+2}, Hg_2^{2+}
6. CO_3^{-2}, PO_4^{-3}, $C_2O_4^{-2}$, CrO_4^{-2}, S^{-2}, OH^-, and O^{-2} are *INSOLUBLE*

(rule 1 takes priority!)

It can be assumed that ionic cmpds. that dissolve in water are strong electrolytes and are therefore soluble.

Heavy metal BAD GUYS!

6. Determine which of the following compounds are soluble in water

a. Silver nitrate

b. Sodium chloride

c. Lead (II) bromide

d. Ammonium hydroxide

e. Barium sulfate

f. Calcium Hydroxide

g. Lithium Carbonate

8. Complete and balance the following reactions, determining, in each case, if a precipitate is formed. Write the molecular equation, the complete ionic equation, and the net ionic equation

a) Potassium chloride in combined with lead (II) nitrate

b) Silver nitrate and magnesium bromide are mixed

c) Sodium chloride and lithium sulfate are mixed

Acid base neutralization reactions:
d) Sodium hydroxide is mixed with phosphoric acid

e) Acetic Acid is mixed with potassium hydroxide

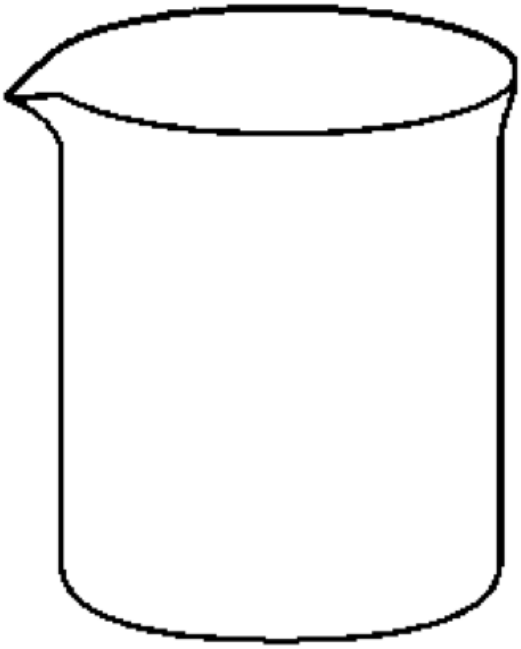
Stoichiometry in Precipitation Reactions:

9. Calculate the mass of silver sulfide produced when 18.0 g of silver nitrate is added to excess sodium sulfide.

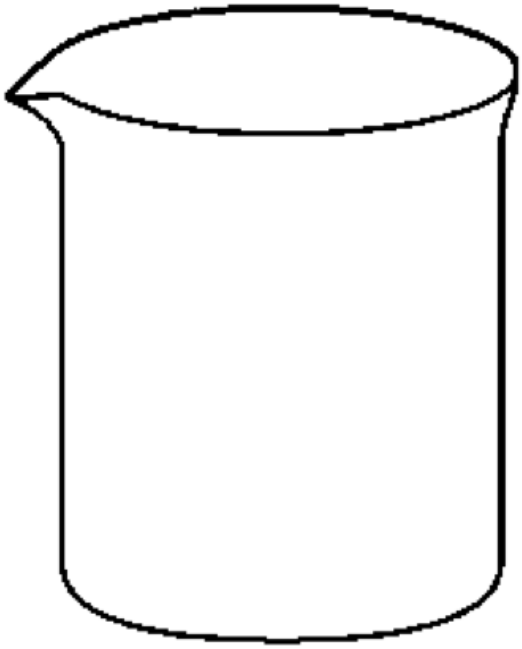
10. What mass of iron (III) hydroxide is produced when 35.0 ml of a 0.250 M solution of iron (III) nitrate is mixed with 55mL of a 0.180M KOH solution?

11. From the previous problem, calculate the molarity of the nitrate ions in the solution after the reaction is complete.

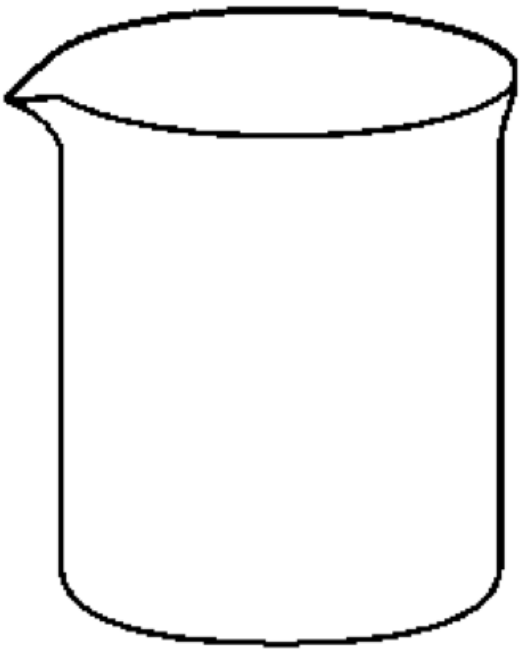
Warm Up! Teacher Led Demonstration: Conductivity In the Beakers



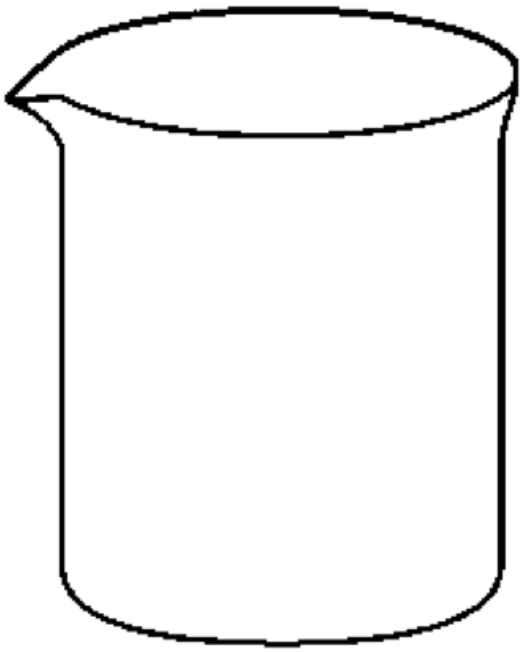
Beaker 1:_____



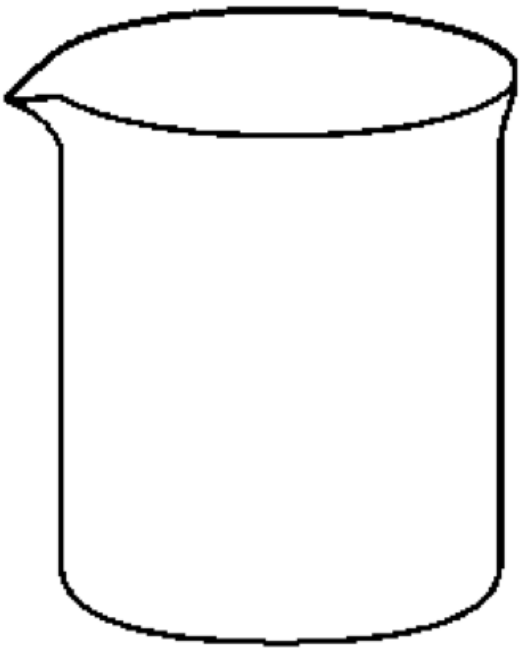
Beaker 2:_____



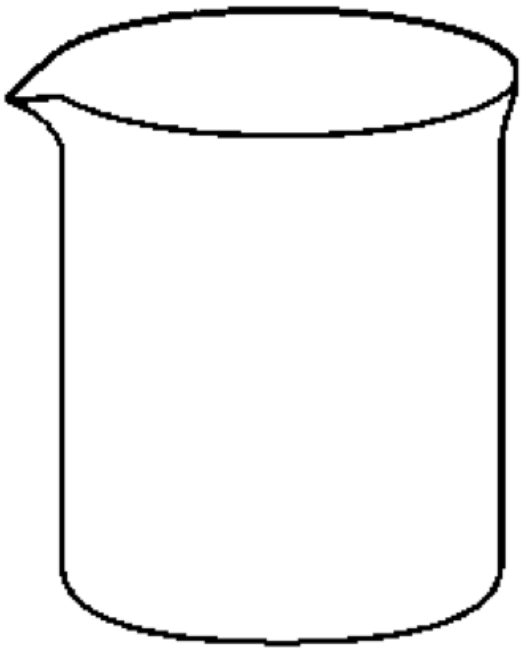
Beaker 3:_____



Beaker 4:_____



Beaker 5:_____



Beaker 6:_____

Acid Base Reactions/Titrations

12. Calculate the molarity of sulfuric acid in a 20.00 mL sample, which is neutralized by 18.50 mLs of 0.750 M NaOH

13. How many grams of $Ba(OH)_2$ are contained in a 25.00 mL solution if 16.52 mL of 0.850 M HCl are required to completely neutralize the sample?

14. If 25.0 mL of 0.625 M HBr are mixed with 42.0 mL of 0.352 M NaOH, will the resulting solution be acidic or basic?

Putting it ALL together! If you can do this problem you can do it all!

15. Potassium dichromate in acidic solution is frequently used to determine the concentration of Fe(II) in solution.

$$Cr_2O_7^{2-}(aq) + 6Fe^{2+}(aq) + 14H^+(aq) \rightarrow 2Cr^{3+}(aq) + 6Fe^{3+}(aq) + 7H_2O(l)$$

A solution of $Cr_2O_7^{2-}$ is prepared by dissolving 6.425 g of $K_2Cr_2O_7$ in 800.0 mL of water. A total of 21.35 mL of this solution is required to reach the end-point in a titration of a 250.0 mL sample containing Fe(II). Determine the concentration of Fe(II) in the solution.