

Name: Key
Pd: _____ Date: _____

REVIEW OF CHEMISTRY 11 FOR CHEMISTRY 12

DAY 2: STOICHIOMETRY AND TITRATIONS

A TITRATION is a process in which a measured amount of a solution is reacted with a solution of known concentration and volume until a desired equivalence point is reached.

THE EQUIVALENCE POINT is when moles of unknown is equal to moles of known in a titration.

Example A:

A 25.0 mL sample of Sodium hydroxide of unknown concentration is neutralized with 23.5 mL of 0.100 M Sulfuric acid. What is the concentration of the Sodium hydroxide?

Step 1. Write out the **balanced equation**:



Step 2. Calculate **moles** of "known"

$$0.0235 \text{ L} \times \frac{0.100 \text{ mol H}_2\text{SO}_4}{1 \text{ L}} \times \boxed{\frac{2 \text{ mol NaOH}}{1 \text{ mol H}_2\text{SO}_4}}$$

Step 3. Cross over to **moles** of "unknown"

Step 4. Determine the **concentration** of "unknown"

recall $M = \text{mol} \div L$



$$= 4.70 \times 10^{-3} \text{ mol NaOH} \div 0.0250 \text{ L}$$

$$= \boxed{0.188 \text{ M NaOH}}$$

Example B:

What volume of 0.200 M Potassium hydroxide is required to react with 125 mL of 0.250M Phosphoric acid in order to produce Potassium hydrogen phosphate and water?

Step 1. Write out the **balanced equation**:



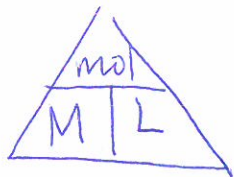
Step 2. Calculate **moles** of "known"

$$0.125 \text{ L} \times \frac{0.250 \text{ mol H}_3\text{PO}_4}{1 \text{ L}} \times \boxed{\frac{3 \text{ mol KOH}}{1 \text{ mol H}_3\text{PO}_4}}$$

Step 3. Cross over to **moles** of "unknown"

Step 4. Determine the **volume** of "unknown"

$$L = \text{mol} \div M$$



$$= 9.375 \times 10^{-2} \text{ mol KOH} \div 0.200 \text{ M}$$

$$= \boxed{0.469 \text{ L KOH}}$$

Work on Examples 17-24