Chemistry

Chapter 19 – Acid & Bases (*neutralization reactions & titrations*)   **Date** _____ **Block**___

Neutralization Reactions

- Double replacement reactions between an _____ and a _____.

- Always produce _____ and _____.

- **Examples**

    - $HCl + KOH \rightarrow$

    - $H_2SO_4 + Ca(OH)_2 \rightarrow$

    - $HNO_3 + NaOH \rightarrow$

    - $H_2CO_3 + Mg(OH)_2 \rightarrow$

Titrations

- A way to determine the _____ of an _____ or _____ solution using the concentration of a _____ solution.

- **Standard solution** – the solution of known concentration in a titration.

- **End point** – Reached with the _____ changes _____ permanently.

- The end point is close, but not exactly, the _____, which is when the acid and base have _____ each other.

- **Steps to calculation a titration problem:**

    - **Step 1:** Find the _____ (using molarity) of the _____ solution.

    - **Step 2:** Use a _____ to find the number of moles of the unknown solution.

    - **Step 3:** Calculate the _____ of the unknown solution using the _____ and calculated moles.

        - *You could also be asked to calculate the volume of the unknown solution needed if the molarity were known instead.*

- **Example 1:** A 25 mL solution of H_2SO_4 (sulfuric acid) is completely neutralized by 18 mL of 1.0 M NaOH (sodium hydroxide). What is the concentration of the sulfuric acid solution?

- **Example 2:** If it takes 30 mL of 0.05 M HCl to neutralize 345 mL of NaOH solution, what is the concentration of the sodium hydroxide solution?

- **Example 3:** How many milliliters of 0.45 M HCl will neutralize 25.0 mL of 1.00 M KOH?

- **Example 4:** What is the molarity of sodium hydroxide if 20.0 mL of the solution is neutralized by 17.4 mL of 1.0 M H_3PO_4?

- **Example 5:** What is the molarity of carbonic acid if 25.0 mL of the solution is neutralized by 48.3 mL of 0.2 M NaOH?