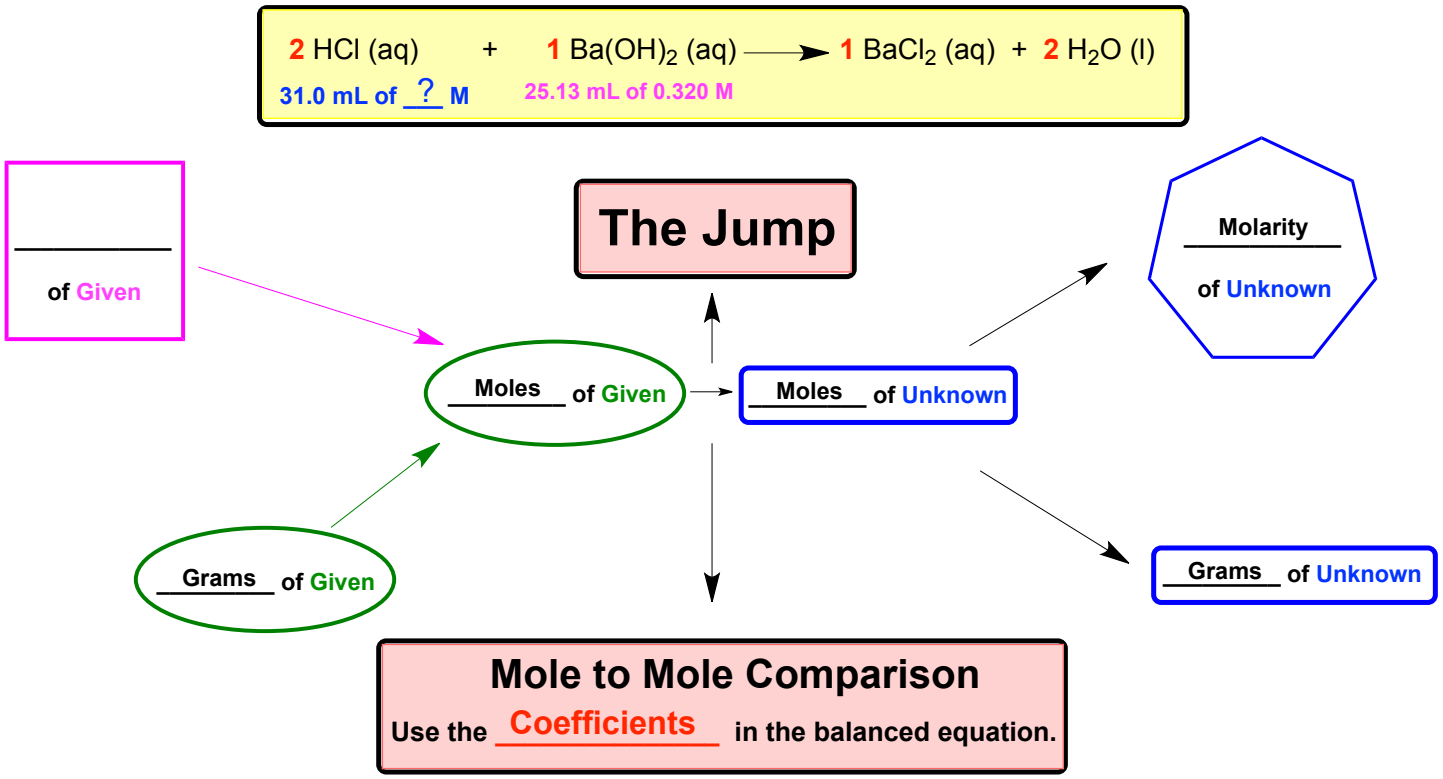
CONCEPT: STRONG ACID STRONG BASE TITRATIONS (SIMPLIFIED)

- Deals with stoichiometric calculations of chemical reactions involving *neutralization* between strong acids and bases.
  - □ **Neutralization:** A chemical reaction in which the _____ of acid and base react stoichiometrically to one another.
  - □ Strong Acids neutralize _____. □ Strong Bases neutralize _____.

Stoichiometric Chart (Acid-Base Titrations)

- The chart uses the **Given** quantity of an acid or base to determine the **Unknown** quantity of another acid or base.



EXAMPLE: If it takes 25.13 mL of 0.320 M $Ba(OH)_2$ to titrate 31.0 mL of a solution containing HCl, what is the molar concentration of HCl?

$$2\ HCl\ (aq) + 1\ Ba(OH)_2\ (aq) \longrightarrow 1\ BaCl_2\ (aq) + 2\ H_2O\ (l)$$

STEP 1: Convert the **given** quantity into moles of **given**.

STEP 2: Do a **mole to mole comparison** to convert moles of **given** into moles of **unknown**.

STEP 3: If necessary, convert the moles of **unknown** into the final desired units.

- □ If molarity is required then divide the moles of **unknown** by its _____.

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PRACTICE: How many grams of HNO_3 are required to completely neutralize 110.0 mL of 0.770 M LiOH?

$$\_\_\_\ HNO_3\ (aq) + \_\_\_\ LiOH\ (aq) \longrightarrow \_\_\_\ LiNO_3\ (aq) + \_\_\_\ H_2O\ (l)$$

PRACTICE: Vinegar is a solution of acetic acid, CH_3COOH, dissolved in water. A 5.54 g sample of vinegar was neutralized by 30.10 mL of 0.100 *M* NaOH. What is the mass percent of acetic acid in the vinegar?

$$\_\_\_\ CH_3COOH\ (aq) + \_\_\_\ NaOH\ (aq) \longrightarrow \_\_\_\ CH_3COONa\ (aq) + \_\_\_\ H_2O\ (l)$$

PRACTICE: What is the molar mass of a 0.350 g sample of a HA acid if it requires 50.0 mL of 0.440 M $Sr(OH)_2$ to completely neutralize it? A is used as a place holder for the unknown nonmetal of the acid.