**IB Chemistry Lab 2**

Limiting Reactant

**Learning Targets:**

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| **1.1 Mol concept & Avogadros Number** |
| 1.1.1 | Apply the mole concept to substances. |
| 1.1.2 | Determine the number of particles and the amount of substance (in moles). |
| **1.2 Formulas** |
| 1.2.1 | Define the terms *relative atomic mass* (*A* r) and *relative molecular mass* (*M* r). |
| 1.2.2 | Calculate the mass of one mole of a species from its formula. |
| 1.2.3 | Solve problems involving the relationship between the amount of substance in moles, mass and molar mass. |
| **1.3 Chemical Equations** |
| 1.3.1 | Deduce chemical equations when all reactants and products are given. |
| 1.3.2 | Identify the mole ratio of any two species in a chemical equation. |
| 1.3.3 | Apply the state symbols (s), (l), (g) and (aq). |
| **1.4 Mass and gaseous volume relationships in chemical reactions** |
| 1.4.1 | Calculate theoretical yields from chemical equations. |
| 1.4.2 | Determine the limiting reactant and the reactant in excess when quantities of reacting substances are given. |
| 1.4.3 | Solve problems involving theoretical, experimental and percentage yield. |
| **1.5 Solutions** |
| 1.5.1 | Distinguish between the terms *solute*, *solvent*, *solution* and *concentration* (g dm–3 and mol dm–3). |
| 1.5.2 | Solve problems involving concentration, amount of solute and volume of solution. |

In this lab a mixture of two salts (sodium hydrogen phosphate and barium chloride) with unknown proportions will be used to determine the limiting reactant in a reaction both experimentally and mathematically. You will also analyze the solution mixture being reacted, and use stoichiometry to determine ion concentrations.

**Pre-Lab: answer the following questions.**

1. Determine the balanced chemical equation for the reaction you will perform.
2. The precipitate that forms is soluble in acids. Will this be an issue? If so, how can you modify your experiment to ensure that your precipitate forms?
3. Devise a plan for determining experimentally which of the two salts is the limiting reactant.
4. Devise a plan for determining mathematically (w/ some exp. data) which of the two salts is the limiting reactant.