STOICHIOMETRY: PERCENT YIELD NOTES

**Ketzbook’s Stoichiometry Tricks Video**

**Vocabulary:**

* *Theoretical Yield***-** The maximum amount of product you can make with what you have.
* *Actual Yield***-**The amount of product that is actually made and collected.
* *Percent Yield* **-** Tells you how well your reaction actually worked.

**Percent Yield Set up:**

*X 100% = Percent Yield*

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| *Actual Yield* |
| *Theoretical Yield* |

# Steps for Calculating Percent Yield:

1. Solve for the theoretical yield by following the steps for grams to grams conversions:
   1. Balance the equation.
   2. Convert grams A given in the problem to moles of A by dividing by the molar(molecular) mass of A from the periodic table.
   3. Determine the mole to mole ratio between A and B.
   4. Convert moles of B to the mass of B by multiplying the molecular mass of B.
   5. Multiply across, divide bottom.
2. Divide the theoretical yield from the actual provided in the question.
3. Multiply by 100 to get the percentage.

**Problem:**

In the lab, 10.0 g of KClO3 were carefully decomposed, and 3.41 g of O2 gas were collected. What are the theoretical, actual, and percent yields of the reaction?

1. Balance reaction:

2KlO3 → 2KCl+ 3O₂

1. Mass of A(KlO3) given: *10 g KlO3*
2. Molar mass of A(KlO3): *122.5 g KlO3*
3. Mole to mole ratio of A and B: *2 mol of A to 3 mol of B (2:3)*
4. Molar Mass of B(O₂): *32 g O2*
5. Use the given information to solve for theoretical yield:

*= 3.92 g O₂*

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| *10 g KlO3* | *1 mol KlO3* | *3 mol O₂* | *32 g O₂* |
|  | *122.5 g KlO3* | *2 mol KlO3* | *1 mol O₂* |

1. Solve for the percent yield:

*X 100% = 87%*

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| *3.41 g O₂* |
| *3.92 g O₂* |

*If your actual yield is greater than your theoretical, what could that suggest?*

You made a mistake and need to redo the experiment or double-check your calculations.

*Adapted from: YouTube. (2017a, March 29). Stoichiometry tricks. YouTube. https://www.youtube.com/watch?v=\_xeqkSQb0Pg*