Percent Yield Worksheet

1) Write the equation for the reaction of iron (III) phosphate with sodium sulfate to make iron (III) sulfate and sodium phosphate.

2) If I perform this reaction with 25 grams of iron (III) phosphate and an excess of sodium sulfate, how many grams of iron (III) sulfate can I make?

3) If 18.5 grams of iron (III) sulfate are actually made when I do this reaction, what is my percent yield?

4) Is the answer from problem #3 reasonable? Explain.

5) If I do this reaction with 15 grams of sodium sulfate and get a 65.0% yield, how many grams of sodium phosphate will I make?

Percent Yield Calculations

1) Balance this equation and state which of the six types of reaction is taking place:

$$\_\_\_\_ Mg + \_\_\_\_ HNO_3 \rightarrow \_\_\_\_ Mg(NO_3)_2 + \_\_\_\_ H_2$$

Type of reaction: _____

2) If I start this reaction with 40 grams of magnesium and an excess of nitric acid, how many grams of hydrogen gas will I produce?

3) If 1.7 grams of hydrogen is actually produced, what was my percent yield of hydrogen?

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4) Balance this equation and state what type of reaction is taking place:

$$\_\_\_\_ NaHCO_3 \rightarrow \_\_\_\_ NaOH + \_\_\_\_ CO_2$$

Type of reaction: _____

5) If 25 grams of carbon dioxide gas is produced in this reaction, how many grams of sodium hydroxide should be produced?

6) If 50 grams of sodium hydroxide are actually produced, what was my percent yield?

Percent Yield Worksheet

1) Write the equation for the reaction of iron (III) phosphate with sodium sulfate to make iron (III) sulfate and sodium phosphate.

$$2\ FePO_4 + 3\ Na_2SO_4 \rightarrow 1\ Fe_2(SO_4)_3 + 2\ Na_3PO_4$$

2) If I perform this reaction with 25 grams of iron (III) phosphate and an excess of sodium sulfate, how many grams of iron (III) sulfate can I make?

33 grams

3) If 18.5 grams of iron (III) sulfate are actually made when I do this reaction, what is my percent yield?

(18.5 / 33) x 100% = 56%

4) Is the answer from problem #3 reasonable? Explain.

Yes. Any yield under 100% is reasonable under the law of conservation of mass.

5) If I do this reaction with 15 grams of sodium sulfate and get a 65.0% yield, how many grams of sodium phosphate will I make?

According to the stoichiometry, the theoretical yield is 11.5 grams. Multiplying this by 0.650, you get 7.48 grams.

Percent Yield Calculation Answers

1) Balance this equation and state which of the six types of reaction is taking place:

$$\underline{1}\ Mg + \underline{2}\ HNO_3 \rightarrow \underline{1}\ Mg(NO_3)_2 + \underline{1}\ H_2$$

Type of reaction: **single displacement**

2) If I start this reaction with 40 grams of magnesium and an excess of nitric acid, how many grams of hydrogen gas will I produce?
- **3.3 grams** (when Mg atomic mass = 24.3 grams)

3) If 1.7 grams of hydrogen is actually produced, what was my percent yield of hydrogen?
- **52%**

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4) Balance this equation and state what type of reaction is taking place:

$$\underline{1}\ NaHCO_3 \rightarrow \underline{1}\ NaOH + \underline{1}\ CO_2$$

Type of reaction: **decomposition**

5) If 25 grams of carbon dioxide gas is produced in this reaction, how many grams of sodium hydroxide should be produced?
22.7 grams NaOH

6) If 50 grams of sodium hydroxide are actually produced, what was my percent yield?
50/22.7 x 100% = 220%
Hopefully, you understand that this is not a reasonable answer to this question and indicates that something very wrong happened during this reaction.