Percent, Actual, and Theoretical Yield

1) $LiOH + KCl \rightarrow LiCl + KOH$

a) I began this reaction with 20 grams of lithium hydroxide. What is my theoretical yield of lithium chloride?

b) I actually produced 6 grams of lithium chloride. What is my percent yield?

2) $C_3H_8 + 5\ O_2 \rightarrow 3\ CO_2 + 4\ H_2O$

a) If I start with 5 grams of C_3H_8, what is my theoretical yield of water?

b) I got a percent yield of 75% How many grams of water did I make?

3) $Be + 2\ HCl \rightarrow BeCl_2 + H_2$

My theoretical yield of beryllium chloride was 10.7 grams. If my actual yield was 4.5 grams, what was my percent yield?

4) $2\ NaCl + CaO \rightarrow CaCl_2 + Na_2O$

What is my theoretical yield of sodium oxide if I start with 20 grams of calcium oxide?

5) $FeBr_2 + 2\ KCl \rightarrow FeCl_2 + 2\ KBr$

a) What is my theoretical yield of iron (II) chloride if I start with 34 grams of iron (II) bromide?

b) What is my percent yield of iron (II) chloride if my actual yield is 4 grams?

6) $TiS + H_2O \rightarrow H_2S + TiO$

What is my percent yield of titanium (II) oxide if I start with 20 grams of titanium (II) sulfide and my actual yield of titanium (II) oxide is 22 grams?

7) $U + 3\ Br_2 \rightarrow UBr_6$

What is my actual yield of uranium hexabromide if I start with 100 grams of uranium and get a percent yield of 83% ?

8) $H_2SO_4 \rightarrow H_2O + SO_3$

If I start with 89 grams of sulfuric acid and produce 7.1 grams of water, what is my percent yield?

Percent, Actual, and Theoretical Yield SOLUTION KEY

1) $LiOH + KCl \rightarrow LiCl + KOH$

a) I began this reaction with 20 grams of lithium hydroxide. What is my theoretical yield of lithium chloride? **35.5 grams**

b) I actually produced 6 grams of lithium chloride. What is my percent yield? **16.9%**

2) $C_3H_8 + 5\ O_2 \rightarrow 3\ CO_2 + 4\ H_2O$

a) If I start with 5 grams of C_3H_8, what is my theoretical yield of water? **8.2 grams**

b) I got a percent yield of 75% How many grams of water did I make? **6.1 grams**

3) $Be + 2\ HCl \rightarrow BeCl_2 + H_2$

My theoretical yield of beryllium chloride was 10.7 grams. If my actual yield was 4.5 grams, what was my percent yield? **42.1 %**

4) $2\ NaCl + CaO \rightarrow CaCl_2 + Na_2O$

What is my theoretical yield of sodium oxide if I start with 20 grams of calcium oxide? **22.1 grams**

5) $FeBr_2 + 2\ KCl \rightarrow FeCl_2 + 2\ KBr$

a) What is my theoretical yield of iron (II) chloride if I start with 34 grams of iron (II) bromide? **20.0 grams of $FeCl_2$**

b) What is my percent yield of iron (II) chloride if my actual yield is 4 grams? **20 %**

6) $TiS + H_2O \rightarrow H_2S + TiO$

What is my percent yield of titanium (II) oxide if I start with 20 grams of titanium (II) sulfide and my actual yield of titanium (II) oxide is 22 grams?

137.5 % (theoretical yield is 16.0 grams – students should recognize that this is a trick question, designed to see if they know that 100% is the highest yield possible

7) $U + 3\ Br_2 \rightarrow UBr_6$

What is my actual yield of uranium hexabromide if I start with 100 grams of uranium and get a percent yield of 83% ? **301.4 grams UBr_6**

8) $H_2SO_4 \rightarrow H_2O + SO_3$

If I start with 89 grams of sulfuric acid and produce 7.1 grams of water, what is my percent yield? **250.2 grams**