**Stoichiometry Test Review Sheet - Revised Key**

Note: The test is going to look a lot like this – only the equations and numbers will be different. If you can do this review sheet, you’ll be fine for the test. Incidentally, if you don’t already do this, make sure that you show your work!

1) Consider this reaction: \_\_\_\_\_Na + \_\_\_\_\_ Fe(OH)3 → \_\_\_\_\_ Fe + \_\_\_\_\_ NaOH

a) Balance the equation in the spaces above.

b) If I perform the reaction with 45 grams of sodium and 55 grams of iron(III) hydroxide, how many grams of sodium hydroxide will be formed?

c) What is the limiting reagent for this reaction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) How much of the excess reagent remains after the reaction is complete?

e) If I actually make 35 grams of sodium hydroxide in this reaction, what is my percent yield? Is this reasonable? Explain.

2) \_\_\_\_\_ Li2CO3 + \_\_\_\_\_ AgNO3 → \_\_\_\_\_ Ag2CO3 + \_\_\_\_\_ LiNO3

a) Balance this equation in the spaces above

b) When doing this reaction, I placed 0.80 grams of lithium carbonate and 1.2 grams of silver nitrate into a beaker to react. Given these numbers, how much silver carbonate will be formed?

c) What is the limiting reagent for the process in part b?

d) How much of the excess reagent will be left over when I do the reaction in part b?

e) When I did this reaction, I found that I actually make 1.0 grams of silver carbonate. What was my percent yield? Is this reasonable? Explain your answer.

The answers are below. I recommend that you do these two problems before checking the answers to see if you’re doing them right!

This page is intentionally blank. The answers to the questions are on the next page. I just put this blank page here so you wouldn’t accidentally see them before you were done answering them. I strongly recommend that you finish solving the questions before checking the answers to ensure that you understand how to do them!

**The answers:**

1) Consider this reaction: 3 Na + 1 Fe(OH)3 → 1 Fe + 3 NaOH

a) Balance the equation in the spaces above.

b) If I perform the reaction with 45 grams of sodium and 55 grams of iron(III) hydroxide, how many grams of sodium hydroxide will be formed?

45 g Na | 1 mol Na | 3 mol NaOH | 40 g NaOH = 78 g NaOH

| 23 g Na | 3 mol Na | 1 mol NaOH

55 g Fe(OH)3 | 1 mol Fe(OH)3 |3 mol NaOH | 40 g NaOH = **62 g NaOH**

| 107 g Fe(OH)3 |1 mol Fe(OH)3|| 1 mol NaOH

Because 62 grams is the smaller of the two numbers, that’s how much NaOH we can make.

c) Fe(OH)3. This is the reagent that leads to the smallest amount of NaOH.

d) **excess reagent = 45 g – 45 g (62/78) = 9.2 grams Na**

e) yield = (35 grams / 62 grams) x 100 = 56% yield

This answer is reasonable because it is less than 100%. Only answers larger than 100% are unreasonable because they violate the law of conservation of mass. While 56% is not a good yield, it is reasonable.

2) 1 Li2CO3 + 2 AgNO3 → 1 Ag2CO3 + 2 LiNO3

a) Balance this equation in the spaces above

b) When doing this reaction, I placed 0.80 grams of lithium carbonate and 1.2 grams of silver nitrate into a beaker to react. Given these numbers, how much silver carbonate will be formed?

0.80 g Li2CO3 |1 mol Li2CO3 |1 mol Ag2CO3 | 276 g Ag2CO3 = 2.98 g

| 74 g Li2CO3 | 1 mol Li2CO3 | 1 mol Ag2CO3

1.2 g AgNO3 | **1 mol AgNO3**| 1 mol Ag2CO3 | 276 g Ag2CO3 = **0.97 g**

| 170 g AgNO3 | 2 mol AgNO3 | 1 mol Ag2CO3

Because **0.97 grams** is the smaller of the two, this is how much silver carbonate will be formed.

c) Silver nitrate is the limiting reagent, as this is the reagent that results in the smallest amount of silver carbonate formed.

d) Amount of Li2CO3 left = 0.80 g – 0.80 g (**0.97 g**/2.98 g) = **0.53 grams**

e) Yield = (1.0 grams/**0.97 grams**) X 100 = **103%**

This answer is **not** reasonable because it’s **greater** than 100% (see answer to #1 above for more explanation.