1. Given the following equation: 2 C4H10 + 13 O2 ---> 8 CO2 + 10 H2O, show what the following molar ratios should be.

a. C4H10 / O2  
b. O2 / CO2  
c. O2 / H2O  
d. C4H10 / CO2  
e. C4H10 / H2O

2. Given the following equation: 2 KClO3 ---> 2 KCl + 3 O2

How many moles of O2 can be produced by letting 12.00 moles of KClO3 react?

3. Given the following equation: 2 K + Cl2 ---> 2 KCl

How many grams of KCl is produced from 2.50 g of K and excess Cl2. From 1.00 g of Cl2 and excess K?

4. Given the following equation: Na2O + H2O ---> 2 NaOH

How many grams of NaOH is produced from 1.20 x 102 grams of Na2O? How many grams of Na2O are required to produce 1.60 x 102 grams of NaOH?

5. Given the following equation: 8 Fe + S8 ---> 8 FeS

What mass of iron is needed to react with 16.0 grams of sulfur? How many grams of FeS are produced?

6. Given the following equation: 2 NaClO3 ---> 2 NaCl + 3 O2

12.00 moles of NaClO3 will produce how many grams of O2? How many grams of NaCl are produced when 80.0 grams of O2 are produced?

7. Given the following equation: Cu + 2 AgNO3 ---> Cu(NO3)2 + 2 Ag

How many moles of Cu are needed to react with 3.50 moles of AgNO3? If 89.5 grams of Ag were produced, how many grams of Cu reacted?

8. Molten iron and carbon monoxide are produced in a blast furnace by the reaction of iron(III) oxide and coke (pure carbon). If 25.0 kilograms of pure Fe2O3 is used, how many kilograms of iron can be produced? The reaction is: Fe2O3 + 3 C ---> 2 Fe + 3 CO

9. The average human requires 120.0 grams of glucose (C6H12O6) per day. How many grams of CO2 (in the photosynthesis reaction) are required for this amount of glucose? The photosynthetic reaction is: 6 CO2 + 6 H2O ---> C6H12O6 + 6 O2

This problem is slightly different from those above.

10. Given the reaction: 4 NH3 (g) + 5 O2 (g) ---> 4 NO (g) + 6 H2O (l)

When 1.20 mole of ammonia reacts, the total number of moles of products formed is:

a. 1.20 b. 1.50 c. 1.80 d. 3.00 e. 12.0

1.

a. 2 / 13  
b. 13 / 8  
c. 13 / 10  
d. 2 / 8 (or 1 / 4)  
e. 2 / 10 (or 1 / 5)

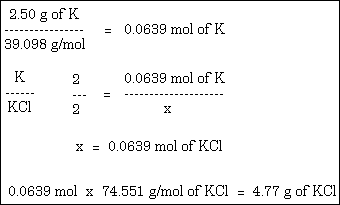
2. The KClO3 / O2 molar ratio is 2/3.

2 mol KClO3 / 3 mol. O2 = 12.00 mol KClO3 / x = 18.00 mol.

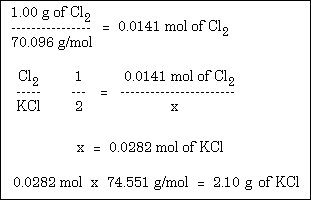
x = 18.00 mol of O2

3. Given the following equation: 2 K + Cl2 ---> 2 KCl

How many grams of KCl is produced from 2.50 g of K and excess Cl2.

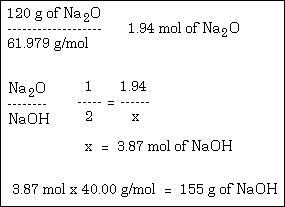


From 1.00 g of Cl2 and excess K?

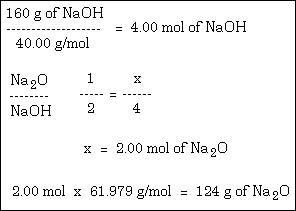


4. Given the following equation: Na2O + H2O ---> 2 NaOH

How many grams of NaOH is produced from 1.20 x 102 grams of Na2O?

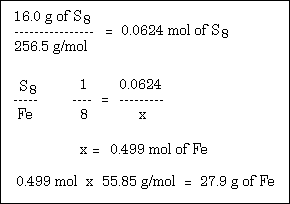


How many grams of Na2O are required to produce 1.60 x 102 grams of NaOH?

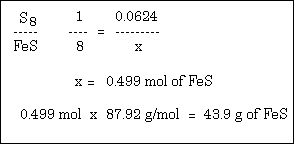


5. Given the following equation: 8 Fe + S8 ---> 8 FeS

What mass of iron is needed to react with 16.0 grams of sulfur?

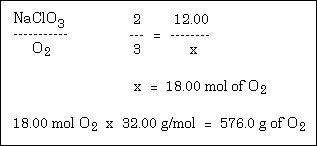


How many grams of FeS are produced?

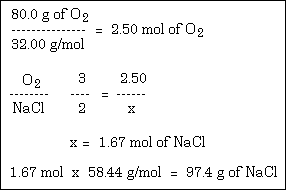


6. Given the following equation: 2 NaClO3 ---> 2 NaCl + 3 O2

12.00 moles of NaClO3 will produce how many grams of O2?

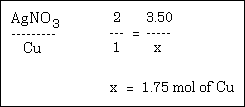


How many grams of NaCl are produced when 80.0 grams of O2 are produced?

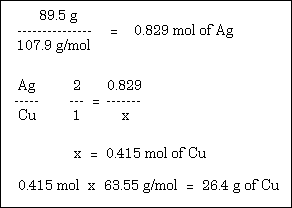


7. Given the following equation: Cu + 2 AgNO3 ---> Cu(NO3)2 + 2 Ag

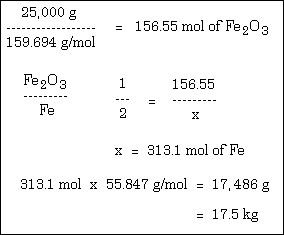
How many moles of Cu are needed to react with 3.50 moles of AgNO3?



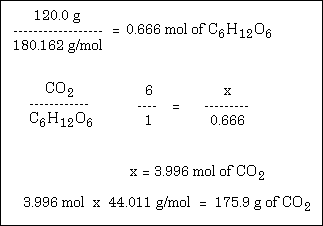
If 89.5 grams of Ag were produced, how many grams of Cu reacted?



8. Molten iron and carbon monoxide are produced in a blast furnace by the reaction of iron(III) oxide and coke (pure carbon). If 25.0 kilograms of pure Fe2O3 is used, how many kilograms of iron can be produced? The reaction is: Fe2O3 + 3 C ---> 2 Fe + 3 CO



9. The average human requires 120.0 grams of glucose (C6H12O6) per day. How many grams of CO2 (in the photosynthesis reaction) are required for this amount of glucose? The photosynthetic reaction is: 6 CO2 + 6 H2O ---> C6H12O6 + 6 O2



This problem is slightly different from those above.

10. Given the reaction: 4 NH3 (g) + 5 O2 (g) ---> 4 NO (g) + 6 H2O (l)

When 1.20 mole of ammonia reacts, the total number of moles of products formed is:

a. 1.20 b. 1.50 c. 1.80 d. 3.00 e. 12.0

The correct answer is d.

NH3 / (NO + H2O) = 4 / 10

4 / 10 = 1.20 / x

x = 3.00 mol