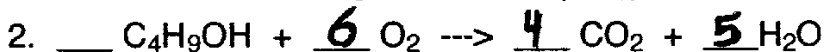


WS 4.8 - Review

Balance these following chemical reactions:



Use dimensional analysis to determine the following:

3. How many molecules are in 0.1029 moles of He?

$$0.1029 \text{ mol} \times \frac{6.02 \times 10^{23} \text{cules}}{1 \text{ mol}} = 6.19 \times 10^{22} \text{cules}$$

Ans

4. 8.4×10^{24} boron atoms weigh how many grams?

$$8.4 \times 10^{24} \text{ atoms} \times \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ atoms}} \times \frac{10.8 \text{ g}}{1 \text{ mol}} = 151 \text{ g}$$

Ans



How many grams of O_2 will be produced from 55.4 g of KClO_3 ?

$$55.4 \text{ g KClO}_3 \times \frac{1 \text{ mol}}{122.6 \text{ g}} \times \frac{3 \text{ mol O}_2}{2 \text{ mol KClO}_3} \times \frac{32.0 \text{ g}}{1 \text{ mol O}_2} = 21.7 \text{ g}$$

Ans



a. Starting with 30.1 g of Na and 22.4 g of Cl_2 , how many grams of NaCl can be made?

$$30.1 \text{ g Na} \times \frac{1 \text{ mol Na}}{23.0 \text{ g}} \times \frac{2 \text{ mol NaCl}}{2 \text{ mol Na}} \times \frac{58.5 \text{ g}}{1 \text{ mol NaCl}} = 76.6 \text{ g}$$

$$22.4 \text{ g Cl}_2 \times \frac{1 \text{ mol Cl}_2}{71 \text{ g}} \times \frac{2 \text{ mol NaCl}}{1 \text{ mol Cl}_2} \times \frac{58.5 \text{ g}}{1 \text{ mol NaCl}} = 36.9 \text{ g}$$

Ans

b. How many g of excess reactant remain?

Ans 15.6 g

$$36.9 \text{ g NaCl} \times \frac{1 \text{ mol NaCl}}{58.5 \text{ g}} \times \frac{2 \text{ mol Na}}{2 \text{ mol NaCl}} \times \frac{23.0 \text{ g}}{1 \text{ mol Na}} = 14.5 \text{ g Na needed}$$

$$\begin{array}{r} 30.1 \\ -14.5 \\ \hline 15.6 \end{array}$$

c. Afterwards, 17.1 grams of NaCl are produced by the reaction. What is the % yield?

$$\frac{17.1}{36.9} \times 100 = \text{Ans } 46.3 \%$$

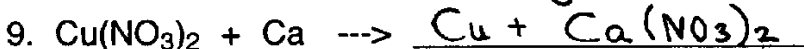
7. A molecule is 87.5% N and is 12.5% H. What is its empirical formula?

$$\begin{array}{l} 87.5 \text{ g N} \times \frac{1 \text{ mol}}{14 \text{ g}} = 6.25 \text{ mol N} \\ 12.5 \text{ g H} \times \frac{1 \text{ mol}}{1 \text{ g}} = 12.5 \text{ mol H} \end{array} \rightarrow \frac{\text{N}_{6.25} \text{H}_{12.5}}{6.25} = \text{NH}_2 = 16 \text{ g/mol}$$

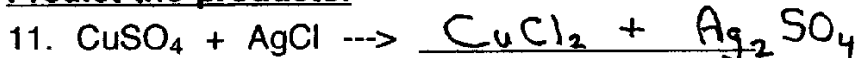
If this molecule's formula weight is 48 g/mol, determine its actual formula: $48 \div 16 = 3$ $\text{NH}_2 \times 3 = \text{N}_3\text{H}_6$

Use the activity series (at right) to predict whether the following reactions will occur...

If YES, then write the products -- If NO, then write 'N. R.' (no reaction)



Predict the products:



ans. bank for #3,4,5,6 (IRO+2): 21.7, 46.3, 6.19E22, 7.96E22, 0.0250, 15.6, 150, 36.9

Li
K
Ca
Na
Mg
Al
Mn
Zn
Cr
Fe
Cd
Co
Ni
Sn
Pb
H
Cu
Hg
Ag
Pt
Au