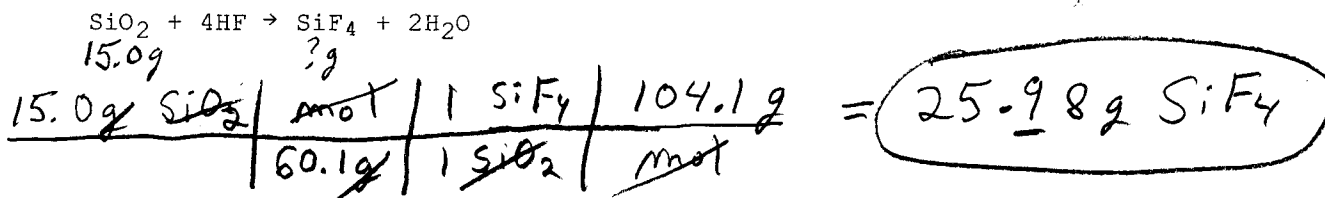


Information: mole =  $6.02 \times 10^{23}$ , molar masses: S = 32.06, Al = 27.0  
 C = 12.01, H = 1.01, Si = 28.1, O = 16.00, P = 31.0, Xe = 131.3, F = 19.0, K = 39.1  
 SHOW WORK TO RECIEVE CREDIT

1. What mass of  $\text{SiF}_4$  could be produced by the reaction of 15 g of  $\text{SiO}_2$  with an excess of HF?  
 The equation for the reaction is:

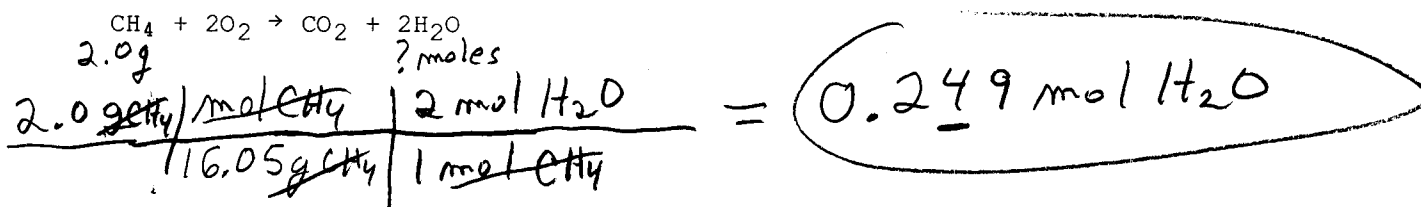


2. What is the percent by mass of sulfur in  $\text{Al}_2(\text{SO}_4)_3$ ?

$$\frac{96}{342} \times 100 = 28.1\%$$

$$\begin{array}{l} 3 \times 4 \times 16 = 192 \\ 3 \times 32 = 96 \\ 2 \times 27 = 54 \\ \hline 342\text{g} \\ \text{mol} \end{array}$$

3. How many moles of  $\text{H}_2\text{O}$  will be produced from the complete combustion of 2.0 grams of  $\text{CH}_4$ ?



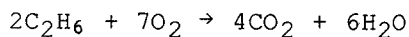
4. What is the mass of 0.432 moles of  $\text{C}_8\text{H}_9\text{O}_4$ ?

$$\frac{0.432 \text{ mol}}{1} \times 169.2 \text{ g/mol} = 73.1 \text{ g}$$

5. Calculate the formula weight of  $\text{K}_3\text{PO}_4$ .

$$\frac{212.3 \text{ g}}{\text{mol}}$$

6. How many moles of  $\text{CO}_2$  would be produced from 56 moles of  $\text{O}_2$  according to the following balanced equation?



56 mole ? moles

$$\frac{56 \text{ mol O}_2}{7 \text{ mol O}_2} \times 4 \text{ mol CO}_2 = 32 \text{ mol CO}_2$$

7. How many phosphorus atoms are there in 15.0 grams of phosphorus?

$$\frac{15.0\text{g}}{31.0\text{g/mol}} \times 6.02 \times 10^{23} \text{ atoms/mol} = 2.91 \times 10^{23} \text{ P atoms}$$

8. The first chemical compound containing a noble gas was prepared in 1962. What is the empirical formula for the compound that is 67.2% xenon and 32.8% oxygen by mass?

$$\text{Xe: } \frac{67.2\text{g}}{131.3\text{g/mol}} = 0.5118 \div 0.5118 = 1$$

$$\text{O: } \frac{32.8\text{g}}{16.0\text{g/mol}} = 2.05 \div 0.5118 = 4$$

