

# Review

(#5-?)

1. (#5-3) In your own words explain the difference between the following.

5,000 marbles 5,000. marbles, 5 marbles?  
 1 sig fig estimate?  $\infty$   
 5,000 meters and 5,000.00 meters, 5 meters?  
 6 sig figs 1 sig fig

Complete the following problems using correct significant figures. Please indicate the number of significant digits for each problem. (#5-3)

2.  $25.0 + .05 = 25.1$  (2) 25.0 (3) 1,000  
 $\begin{array}{r} 25.0 \\ + .05 \\ \hline 25.05 \end{array} \rightarrow 25.1$  (round)
3.  $1.0E3 + 155. = 1,200$  (3) 1,000  
 $\begin{array}{r} 1000 \\ + 155 \\ \hline 1155 \end{array} \rightarrow 1200$  (round)
4.  $1234.0 - 22.000 = 1212.0$  (4) 1234.0 (5) 1,000  
 $\begin{array}{r} 1234.0 \\ - 22.000 \\ \hline 1212.000 \end{array}$
5.  $250.0 * .0005 = 0.1$  (2) 250.0 (4) 1,000  
 $250.0 * 0.0005 = 0.125$  (round)  $\rightarrow 0.1$
6.  $0.1000 * 2 = 0.2$  (1) 0.1000 (4) 1,000  
 $0.1000 * 2 = 0.2000$  (round)  $\rightarrow 0.2$
7.  $3.5000E9 * .100 = 3.50E8$  (3) 3.5000E9 (4) 1,000  
 $3.5000E9 * 0.100 = 350,000,000$  (round)  $\rightarrow 3.50E8$
8.  $2500000. / 2500000.0 = 1.0$  (2) 2500000. (4) 1,000  
 $2500000. / 2500000.0 = 1.000000$  (round)  $\rightarrow 1.0$

Conversions (#5-1)

9. Convert 524.0 cm to km.  $524.0 \text{ cm} \times \frac{1 \text{ m}}{100 \text{ cm}} \times \frac{1 \text{ km}}{1000 \text{ m}} = 0.005240 \text{ km}$  (4)
10. Convert 100.0 ft/sec to miles/sec  $100.0 \text{ ft} \times \frac{1 \text{ mile}}{5280 \text{ ft}} = 0.01894 \text{ miles/sec}$  (4 sig)
11. How many feet are in 105. meters?  $105 \text{ m} \times \frac{100 \text{ cm}}{1 \text{ m}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{1 \text{ ft}}{12 \text{ in}} = 344 \text{ ft}$  (3)

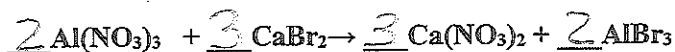
Chemical conversions (#5-1)

12. How much does 1 mole of CO<sub>2</sub> weigh?  
 $C - 1 \times 12 = 12$   
 $O - 2 \times 16 = 32$   
 Total = 44 g/mol
13. If you had 40.0 grams of CO<sub>2</sub>, do you have more or less than one mole?  
 $\frac{40.0 \text{ g CO}_2}{44 \text{ g CO}_2/\text{mol}} = 0.909$  (less than 1 mol)
14. How many actual molecules are in the 40.0g sample of CO<sub>2</sub>?  
 $40.0 \text{ g CO}_2 \times \frac{1 \text{ mol CO}_2}{44 \text{ g CO}_2} \times 6.02E23 = 5.47E22$  (molecules)
15. Does a 36.36g sample of Ca have more, less or equal number of particles than the 40.0g of CO<sub>2</sub>?  
 $\frac{36.36 \text{ g Ca}}{40.1 \text{ g Ca/mol}} = 0.907 \text{ mol}$  (equal)
16. A 3.0E23 atoms of carbon has what mass?  
 $3.0E23 \times \frac{1 \text{ mol C}}{6.02E23} \times 12 \text{ g C} = 0.60 \text{ g C}$

Saffron costs \$368.00 per ounce. (1 gram = 2 teaspoons of saffron)

17. Determine how many grams you can purchase for \$20.00.  
 $\frac{\$20}{\$368} \times 1 \text{ oz} = 0.0543 \text{ oz}$  (1.241g saffron)
18. If your recipe requires 3 teaspoons of saffron, what will this cost?  
 $3 \text{ tsp saffron} \times \frac{1 \text{ gram}}{2 \text{ tsp}} \times \frac{1 \text{ oz}}{28.35 \text{ gram}} = 0.053 \text{ oz}$  (cost: \$19.57)

Balance this reaction. (Must show work with factor label in #14 and #15)



19. (#5-2) If 50.  $\text{Al}(\text{NO}_3)_3$  molecules were used in this reaction how many  $\text{Ca}(\text{NO}_3)_2$  and  $\text{AlBr}_3$  molecules are produced?

$$50 \text{Al}(\text{NO}_3)_3 \left| \begin{array}{l} 3 \text{Ca}(\text{NO}_3)_2 \\ 2 \text{Al}(\text{NO}_3)_3 \end{array} \right. = 75 \text{Ca}(\text{NO}_3)_2$$

$$50 \text{Al}(\text{NO}_3)_3 \left| \begin{array}{l} 2 \text{AlBr}_3 \\ 2 \text{Al}(\text{NO}_3)_3 \end{array} \right. = 50 \text{AlBr}_3$$

20. (#5-2) If 60.  $\text{Ca}(\text{NO}_3)_2$  molecules are produced how many  $\text{Al}(\text{NO}_3)_3$  and  $\text{CaBr}_2$  molecules are used in this reaction?

$$60 \text{Ca}(\text{NO}_3)_2 \left| \begin{array}{l} 2 \text{Al}(\text{NO}_3)_3 \\ 3 \text{Ca}(\text{NO}_3)_2 \end{array} \right. = 40 \text{Al}(\text{NO}_3)_3$$

$$60 \text{Ca}(\text{NO}_3)_2 \left| \begin{array}{l} 3 \text{CaBr}_2 \\ 3 \text{Ca}(\text{NO}_3)_2 \end{array} \right. = 60 \text{CaBr}_2$$