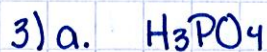


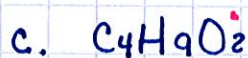
- 1) a.  $\text{Al(OH)}_3$  - has 3 H's  
 b.  $\text{H}_2\text{C}_2\text{O}_4$  - has 2 H's

- c.  $(\text{NH}_4)_2\text{HPO}_4$  - has 9 H's  
 d.  $\text{C}_4\text{H}_{10}\text{O}$  - has 10 H's

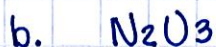
2) They all have the same number of molecules,  $1 \text{ mol} = 6.02 \times 10^{23}$  molecules



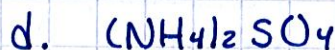
$$\begin{aligned} 3 \text{ H} (1.0078 \text{ g}) &= 3.0234 \text{ g} \\ 1 \text{ P} (30.974 \text{ g}) &= 30.974 \text{ g} \\ 4 \text{ O} (15.999 \text{ g}) &= 63.996 \text{ g} \\ &+ \\ &\boxed{97.9934 \text{ g}} \end{aligned}$$



$$\begin{aligned} 4 \text{ C} (12.011 \text{ g}) &= 48.044 \text{ g} \\ 9 \text{ H} (1.0079 \text{ g}) &= 9.0702 \text{ g} \\ 2 \text{ O} (15.999 \text{ g}) &= 31.998 \text{ g} \\ &+ \\ &\boxed{89.1122 \text{ g}} \end{aligned}$$



$$\begin{aligned} 2 \text{ N} (14.007 \text{ g}) &= 28.014 \text{ g} \\ 3 \text{ O} (15.999 \text{ g}) &= 47.997 \text{ g} \\ &+ \\ &\boxed{76.011 \text{ g}} \end{aligned}$$



$$\begin{aligned} 2 \text{ N} (14.007 \text{ g}) &= 28.014 \text{ g} \\ 8 \text{ H} (1.0078 \text{ g}) &= 8.0624 \text{ g} \\ 1 \text{ S} (32.059 \text{ g}) &= 32.059 \text{ g} \\ 4 \text{ O} (15.999 \text{ g}) &= 63.996 \text{ g} \\ &+ \\ &\boxed{132.1314 \text{ g}} \end{aligned}$$

4) a.  $15.5 \text{ g SiO}_2 \left( \frac{1 \text{ mol}}{60.083 \text{ g}} \right) = \boxed{.258 \text{ mol SiO}_2}$

b.  $0.0688 \text{ g AgCl} \left( \frac{1 \text{ mol}}{143.316 \text{ g}} \right) = \boxed{4.80 \times 10^{-4} \text{ mol AgCl} \text{ or } 0.000480 \text{ mol AgCl}}$

5) a.  $0.780 \text{ mol Ca(CN)}_2 \left( \frac{92.114 \text{ g}}{1 \text{ mol}} \right) = \boxed{71.8 \text{ g Ca(CN)}_2}$

b.  $7.00 \text{ mol H}_2\text{O}_2 \left( \frac{34.0136 \text{ g}}{1 \text{ mol}} \right) = \boxed{238 \text{ g H}_2\text{O}_2}$

6) a.  $7.6 \text{ mol Ar} \left( \frac{22.4 \text{ L}}{1 \text{ mol}} \right) = \boxed{170 \text{ L Ar}}$

b.  $.44 \text{ mol C}_2\text{H}_6 \left( \frac{22.4 \text{ L}}{1 \text{ mol}} \right) = \boxed{9.9 \text{ L C}_2\text{H}_6}$

$$7) a. 14.4 \text{ L } F_2 \left( \frac{1 \text{ mol}}{22.4 \text{ L}} \right) = 0.643 \text{ mol } F_2$$

$$b. 3.21 \times 10^2 \text{ L } CO_2 \left( \frac{1 \text{ mol}}{22.4 \text{ L}} \right) = 14.3 \text{ mol } CO_2$$

$$8) a. 3.00 \text{ mol Sn} \left( \frac{6.02 \times 10^{23} \text{ atoms}}{1 \text{ mol}} \right) = 1.81 \times 10^{24} \text{ atoms Sn}$$

$$b. 0.400 \text{ mol KCl} \left( \frac{6.02 \times 10^{23} \text{ f.units}}{1 \text{ mol}} \right) = 2.41 \times 10^{23} \text{ f.units KCl}$$

$$9) a. 4.80 \times 10^{20} \text{ f.units NaI} \left( \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ f.units}} \right) = 7.97 \times 10^{-4} \text{ mol NaI or } 0.000797 \text{ mol NaI}$$

$$b. 7.50 \times 10^{24} \text{ molecules } SO_2 \left( \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} \right) = 12.5 \text{ mol } SO_2$$

$$10) a. 835 \text{ g } SO_3 \left( \frac{1 \text{ mol}}{80.056 \text{ g}} \right) \left( \frac{22.4 \text{ L}}{1 \text{ mol}} \right) = 234 \text{ L } SO_3$$

$$b. 1 \text{ molecule } C_9H_8O_4 \left( \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} \right) \left( \frac{180.1574 \text{ g}}{1 \text{ mol}} \right) = 3 \times 10^{-22} \text{ g } C_9H_8O_4$$

$$c. 146 \text{ L } O_3 \left( \frac{1 \text{ mol}}{22.4 \text{ L}} \right) \left( \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} \right) = 3.92 \times 10^{24} \text{ molecules } O_3$$

11) a.  $H_2S$

$$2 \text{ H} (1.0078 \text{ g}) = 2.0156 \text{ g}$$

$$1 \text{ S} (32.059 \text{ g}) = 32.059 \text{ g}$$

$$\hline 34.0746 \text{ g}$$

$$\% H = \frac{2.0156 \text{ g}}{34.0746 \text{ g}} \times 100 = 5.9153 \%$$

$$\% S = \frac{32.059 \text{ g}}{34.0746 \text{ g}} \times 100 = 94.085 \%$$

b.  $Mg(OH)_2$

$$1 \text{ Mg} (24.305 \text{ g}) = 24.305 \text{ g}$$

$$2 \text{ O} (15.994 \text{ g}) = 31.998 \text{ g}$$

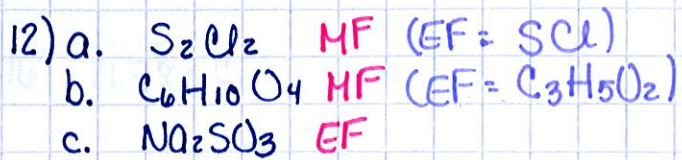
$$2 \text{ H} (1.0078 \text{ g}) = 2.0156 \text{ g}$$

$$\hline 58.3186 \text{ g}$$

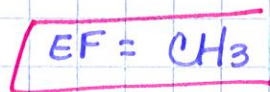
$$\% Mg = \frac{24.305 \text{ g}}{58.3186 \text{ g}} \times 100 = 41.676 \%$$

$$\% O = \frac{31.998 \text{ g}}{58.3186 \text{ g}} \times 100 = 54.868 \%$$

$$\% H = \frac{2.0156 \text{ g}}{58.3186 \text{ g}} \times 100 = 3.4562 \%$$

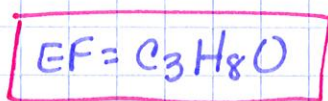


13) a.  $79.8 \text{ g C} / 12.011 \text{ g/mol} = \frac{6.6439 \text{ mol C}}{6.6439 \text{ mol}} = 1 \text{ C}$



$20.2 \text{ g H} / 1.0078 \text{ g/mol} = \frac{20.0437 \text{ mol H}}{6.6439 \text{ mol}} = 3 \text{ H}$

b.  $62.1 \text{ g C} / 12.011 \text{ g/mol} = \frac{5.1703 \text{ mol C}}{1.7206 \text{ mol}} = 3 \text{ C}$



$13.8 \text{ g H} / 1.0078 \text{ g/mol} = \frac{13.6932 \text{ mol H}}{1.7206 \text{ mol}} = 8 \text{ H}$

$24.1 \text{ g N} / 14.007 \text{ g/mol} = \frac{1.7206 \text{ mol N}}{1.7206 \text{ mol}} = 1 \text{ N}$

14) a. EF =  $CH_2O$

molecular mass = 90 g

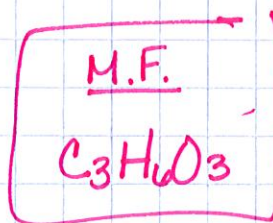
MM<sub>EF</sub>

1 C (12g) = 12g

2 H (1g) = 2g

1 O (16g) = 16g  
 ~ 30g

$\frac{90 \text{ g}}{\sim 30 \text{ g}} = 3$



b. EF =  $HgCl$

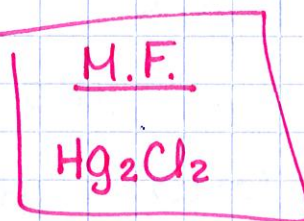
molecular mass = 472.2 g

MM<sub>EF</sub>

1 Hg (201g) = 201g

1 Cl (35g) = + 35g  
 ~ 236g

$\frac{472.2 \text{ g}}{\sim 236 \text{ g}} = 2$



15)  $58.8 \text{ g C} / 12.011 \text{ g/mol} = \frac{4.8955 \text{ mol C}}{1.9626 \text{ mol}} = (2.5 \text{ C})_2$

EF =  $C_5H_{10}O_2$

$9.8 \text{ g H} / 1.0078 \text{ g/mol} = \frac{9.7242 \text{ mol H}}{1.9626 \text{ mol}} = (5 \text{ H})_2$

MM<sub>EF</sub>

5 C (12g) = 60g

10 H (1g) = 10g

2 O (16g) = 32g  
 102g

$31.4 \text{ g O} / 15.999 \text{ g/mol} = \frac{1.9626 \text{ mol O}}{1.9626 \text{ mol}} = (1 \text{ O})_2$

$\frac{102 \text{ g}}{102 \text{ g}} = 1$

