

Quiz 5

16/20

Name: Erin McCowan

1. A 15.0 g sample of a compound contains 6.0 g of carbon. What is the percent composition of carbon in the compound?

$$\frac{6.0 \text{ g}}{15.0 \text{ g}} \times 100 = 40\%$$



2. 3.43 % of the sample is composed of nitrogen. If the mass of the nitrogen is 15.6 g, what is the total mass of the sample?

$$3.43\% = \frac{15.6 \text{ g}}{?} \times 100 \rightarrow 0.0343 = \frac{15.6 \text{ g}}{?} \rightarrow ? = \frac{15.6 \text{ g}}{0.0343}$$

total mass = 45.48 g

0.0343  
(-)

3. How many CO<sub>2</sub> molecules are in 0.000534 g of CO<sub>2</sub>?

$$\frac{0.000534 \text{ g}}{1} \times \frac{1 \text{ mol}}{44.01 \text{ g}} \times \frac{6.022 \times 10^{23}}{1 \text{ mol}} = 7.307 \times 10^{18} \text{ molecules CO}_2$$



C = 12.01

O<sub>2</sub> = 32.00

4. How many grams are equivalent to  $3.40 \times 10^{36}$  atoms of iron (Fe)?

$$55.85 \text{ g} \times \frac{1 \text{ mol}}{3.40 \times 10^{36} \text{ atoms}} \times \frac{6.022 \times 10^{23} \text{ atoms Fe}}{1 \text{ mol}} = 9.842 \times 10^{12} \text{ grams of Fe}$$

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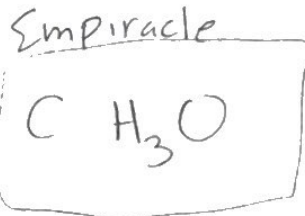
5. A compound is found to be composed of 40.454% carbon, 5.658% hydrogen, and 53.888% oxygen by mass. The experimental molar mass of the compound is 267.21 g/mol. Determine the empirical and molecular formula of the compound.

$$\text{C: } 40.454 \times \frac{1 \text{ mol}}{12.01} = 3.368 / 3.368 = 1 \quad \times 3$$

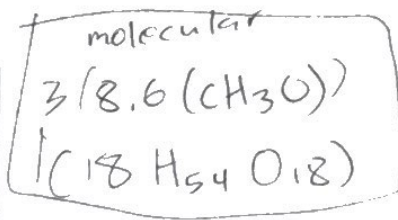
$$\text{H: } 5.658 \times \frac{1 \text{ mol}}{1.008} = 5.613 / 3.368 = 1.66... \times 3$$

$$\text{O: } 53.888 \times \frac{1 \text{ mol}}{16.00} = 3.368 / 3.368 = 1 \quad \times 3$$

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$$\frac{267.21 \text{ g/mol}}{31.034} = 8.6102 \text{ g/mol}$$



1	1 H 1.008	IIA														2 He 4.003		
2	3 Li 6.941	4 Be 9.012															10 Ne 20.18	
3	11 Na 23.00	12 Mg 24.31															18 Ar 39.95	
4	19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.90	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.71	29 Cu 63.55	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
5	37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (99)	44 Ru 101.0	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
6	55 Cs 132.9	56 Ba 137.3	57 La* 138.9	72 Hf 178.9	73 Ta 180.9	74 W 183.9	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po (210)	85 At (210)	86 Rn (222)
7	87 Fr (223)	88 Ra (226)	89 Ac* (227)															
													III A 13 Al 26.98	IV A 14 Si 28.09	V A 15 P 30.97	V I A 16 S 32.06	V II A 17 Cl 35.45	