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?**

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

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?**

$3.43\% = \frac{15.6\,g}{?} \times 100 \rightarrow .0343 = \frac{15.6\,g}{?} \rightarrow ? = \frac{15.6\,g}{0.0343}$ (-1)

total mass = 45.48 g

3. **How many CO_2 molecules are in 0.000534 g of CO_2?**

$\frac{0.000534\,g}{1} \times \frac{1\,mol}{44.01\,g} \times \frac{6.022 \times 10^{23}}{1\,mol} = 7.307 \times 10^{18}$ molecules CO_2

$C = 12.01$

$O_2 = 32.00$

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

$55.85\,g \times \frac{1\,mol}{3.40 \times 10^{36}\ atoms} \times \frac{6.022 \times 10^{23}\ atoms\ Fe}{1\,mol}$

$= 9.842 \times 10^{12}$ grams of Fe

-2

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.

C: $40.454 \times \frac{1\,mol}{12.01} = 3.368 / 3.368 = 1$ x3

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

O: $53.888 \times \frac{1\,mol}{16.00} = 3.368 / 3.368 = 1$ x3

-1

Empiracle

$C\ H_3O$

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

molecular

$3(8.6(CH_3O))$

$1(18\ H_{54}O_{18})$

1	1 H 1.008	IIA											IIIA	IVA	VA	VIA	VIIA	2 He 4 003
2	3 Li 6.941	4 Be 9.012											5 B 10.91	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
3	11 Na 23.00	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	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)															