

Chp 5

1) (2 pt) The law of constant composition states:

- A) Matter cannot be either created or destroyed in a chemical reaction.
 B) The nucleus is a dense region of positive charge that always contains protons and neutrons.
 C) All samples of a given compound have the same proportions of their constituent elements.
 D) All atoms of a given element have a constant composition and are different than atoms of any other element.
 E) none of the above

2) (2 pt) What is the formula mass of copper(II) fluoride? *Show work*

$$\begin{array}{l} \text{Cu} \\ 2 \text{ F} \end{array} \begin{array}{l} 63.54 \\ + 2(18.998) \\ \hline 101.54 \end{array} \quad \text{CuF}_2 \quad \boxed{101.54 \text{ amu}}$$

Chp 6

3) (2 pt) How many moles of water are there in 9.3×10^{23} molecules of water? *Show work*

$$\text{H}_2\text{O} \quad 9.3 \times 10^{23} \times \frac{1 \text{ mol}}{6.022 \times 10^{23} \text{ molecules}} = \boxed{1.5 \text{ mol H}_2\text{O}}$$

4) (4 pt) How many moles of chlorine gas are there in 35.45 grams of chlorine gas? *Show work*

$$35.45 \text{ g Cl}_2 \times \frac{1 \text{ mol Cl}_2}{70.90 \text{ g}} = \boxed{0.5000 \text{ mol Cl}_2}$$

5) (5 pt) How many hydrogen atoms are there in 3.00 grams of $\text{HC}_2\text{H}_3\text{O}_2$ (molar mass is 60.06 g/mole). *Show work*

$$3.00 \text{ g HC}_2\text{H}_3\text{O}_2 \times \frac{1 \text{ mol HC}_2\text{H}_3\text{O}_2}{60.06 \text{ g}} \times \frac{4 \text{ mol H}}{1 \text{ mol HC}_2\text{H}_3\text{O}_2} \times \frac{6.022 \times 10^{23} \text{ atoms}}{1 \text{ mol}} = \frac{3.00 \times 4 \times 6.022 \times 10^{23}}{60.06} \text{ H atoms} = \boxed{1.20 \times 10^{23} \text{ H atoms}}$$

PERIODIC CHART OF THE ELEMENTS

IA	IIA	IIIB	IVB	VB	VIB	VII B	VIII	IB	IIB	IIIA	IVA	VA	VIA	VIIA	INERT GASES		
1 H 1.00797														1 H 1.00797	2 He 4.0026		
3 Li 6.939	4 Be 9.0122										5 B 10.811	6 C 12.0112	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.183	
11 Na 22.9898	12 Mg 24.312										13 Al 26.9815	14 Si 28.086	15 P 30.9738	16 S 32.064	17 Cl 35.453	18 Ar 39.948	
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.9216	34 Se 78.96	35 Br 79.909	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc [99]	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.904	54 Xe 131.30
55 Cs 132.905	56 Ba 137.34	*57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59	81 Tl 204.37	82 Pb 207.19	83 Bi 208.980	84 Po [210]	85 At [210]	86 Rn [222]
87 Fr [223]	88 Ra [226]	†89 Ac [227]	104 Rf [261]	105 Db [262]	106 Sg [266]	107 Bh [266]	108 Hs [265]	109 Mt [268]	110 ? [271]	111 ? [272]	112 ? [277]						

Numbers in parenthesis are mass numbers of most stable or most common isotopes.

* Lanthanide Series

58 Ce 140.12	59 Pr 140.907	60 Nd 144.24	61 Pm [147]	62 Sm 150.35	63 Eu 151.96	64 Gd 157.25	65 Tb 158.924	66 Dy 162.50	67 Ho 164.930	68 Er 167.26	69 Tm 168.934	70 Yb 173.04	71 Lu 174.97
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† Actinide Series

90 Th 232.038	91 Pa [231]	92 U 238.03	93 Np [237]	94 Pu [242]	95 Am [243]	96 Cm [247]	97 Bk [247]	98 Cf [249]	99 Es [254]	100 Fm [253]	101 Md [258]	102 No [258]	103 Lr [257]
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Atomic weights corrected to conform to the 1963 values of the Commission on Atomic Weights.

The group designations used here are the former Chemical Abstract Service numbers.