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Chemistry Trimester 1 Review Sheet

Chapter 1

1. What is the Scientific Method? How would you design an experiment to test "Drinking coffee at night keeps me awake."
2. What's the difference between a theory and a hypothesis?

Chapter 4

3. What are some properties of metals, metalloids, and non metals? Give 3 examples of each. Where can each be found on the Periodic Table of Elements?
4. What is the name of the element in Group 4 Period 4?
5. What is Dalton's atomic theory? What are the three sub-particles of an atom, where are they located, and what are their charges?
6. What is an amu? Give the amu for each sub-particle.
7. What were the contributions of the following scientists: Mendeleev, Rutherford, JJ Thompson, and Dalton?
8. How many protons, neutrons, and electrons do the following elements contain: Neon, Barium, Bromine, Fluorine?
9. What is the difference between atomic mass, mass number, and atomic number?
10. If an element has an atomic number of 53, the weight of 127, how many neutrons does it have?
11. What is a valence electron? What is its purpose in bonding?
12. What is an orbital? How many electrons can one orbital hold?
13. What is the maximum number of electrons that can be held by each of the following subshells: s, p, d, f?
14. What is the ground state of an element?
15. What element has the electron configuration:$1s^2$, $2s^2$, $2p^2$? The abbreviated configuration of [Kr} $5s^2 4d^{10} 5p^3$
16. What is ionization energy? What is an atomic spectra?
17. What is the octet rule?
18. What charge do elements in group 1A form? Group 2A? Group17, Group 18?
19. What happens to the size of an atom as you move across the Periodic Table of Elements? What happens when you move down?
20. Two isotopes of Rb occur naturally, 85-Rb at 72.17% (84.91amu) and 87-Rb at 27.83% (86.91 amu). What is the atomic mass of Rb?

Chapter 5

1. What is the electromagnetic spectrum? List the parts of the electromagnetic spectrum in order of increasing frequency and photon energy.
2. What is a photon? An atomic spectrum?
3. What happens when an electron moves to a higher energy level? To a lower one?

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4. Consider these three elements: X= $[Ar]4s^2 3d^5$ Y=$[Ar]4s^2 3d^{10} 4p^1$ Z=$[Ar]4s^2 3d^{10} 4p^6$

a. Identify each element and tell if it is a metal, nonmetal, or metalloid
b. Which element has the smallest atomic size?
c. Which element has the highest ionization energy?
d. Which element has a half-filled sublevel?

Chapter 2

Indicate how many significant figures there are in each of the following measured values.

107.854 _____ 0.00340 _____ 350.670 _____

100.3 _____ 14.600 _____ 1.0000 _____

0.678 _____ 0.0001 _____ 320001 _____

Calculate the answers to the appropriate number of significant figures.

32.567	246.24	658.0
135.0	238.278	23.5478
+ 1.4567	+ 98.3	+ 1345.29

Calculate the answers to the appropriate number of significant figures.

23.7 x 3.8	= _____	43.678 x 64.1	= _____
45.76 x 0.25	= _____	1.678 / 0.42	= _____
81.04 g x0.010	= _____	28.367 / 3.74	= _____
6.47 x 64.5	= _____	4278 / 1.006	= _____

Are these exact or measured numbers?

1. The number of socks in a drawer _____
2. The length of a door _____
3. The distance from your house to the mall _____

_____ zeros doing count but _____ zeros do.

What is the formula for density? If a rock has a mass of 4.56 g and its volume (using a graduated cylinder) was 3.1 mL, what is its density?

Express each of these in Scientific notation.

1. 0.000033 = _____
2. 50,000. = _____
3. 0.000002 = _____
4. 230,000 = _____
5. 465 = _____

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Express each of these as a common number

1. 3.7×10^{5} = _____
2. 3.21×10^{-4} = _____
3. 6×10^{5} = _____
4. 1.99×10^{-3} = _____
5. 1.7×10^{12} = _____
6. 8.653×10^{-17} = _____

Chapter 16 Nuclear Decay

The following atoms all undergo alpha particle emission. Write the complete nuclear equation.

$^{210}_{84}Po \rightarrow$ _____ + _____

$^{238}_{92}U \rightarrow$ _____ + _____

The following atoms all undergo beta decay. Write the complete nuclear equation.

$^{14}_{6}C \rightarrow$ _____ + _____

$^{90}_{38}Sr \rightarrow$ _____ + _____

The following all undergo electron capture. Write the complete nuclear equation.

$^{106}_{47}Ag$ + _____ $\rightarrow$ _____

$^{116}_{50}Sn$ + _____ $\rightarrow$ _____

The following all undergo positron emission. Write the complete nuclear equation.

$^{116}_{50}Sn \rightarrow$ _____ + _____

$^{61}_{29}Cu \rightarrow$ _____ + _____

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Complete the missing information in the reactions. Then, label the reaction one of the following:

Alpha Decay, Beta Decay, Positron Emission

$\_\_\_\_ \rightarrow {}^{14}_{7}\mathrm{N} + {}^{0}_{-1}\mathrm{e}$ Type: _____

${}^{238}_{92}\mathrm{U} \rightarrow {}^{234}_{90}\mathrm{Th} + \_\_\_\_$ Type: _____

${}^{15}_{8}\mathrm{O} \rightarrow {}^{15}_{7}\mathrm{N} + \_\_\_\_$ Type: _____

${}^{105}_{47}\mathrm{Ag} + \_\_\_\_ \rightarrow {}^{105}_{46}\mathrm{Pd}$ Type: _____

$\_\_\_ \rightarrow {}^{0}_{+1}\mathrm{e} + {}^{40}_{20}\mathrm{Ca}$ Type: _____

${}^{244}_{94}\mathrm{Pu} \rightarrow {}^{4}_{2}\mathrm{He} + \_\_\_\_\_$ Type: _____

How long does it take a 100.00g sample of Au-l 98 to decay to 6.25g?

How many half-lives will pass by the time a 60.0g sample of Co-60 decays to 7.59?

If a 700.00g sample of I-131 decays to 43.75g, how much time has passed?

Chapter 3

1. What is a pure substance? An element? An atom?
2. What is the difference between a homogeneous mixture and a heterogeneous mixture?
3. What is the difference between a solid, a liquid, and a gas?
4. What is the difference between a physical and chemical property? Give an example of each.
5. Convert 45 degrees Fahrenheit to Celsius and then Kelvin.
6. Convert -23 degrees Celsius to Fahrenheit and also to Kelvin.
7. What is the difference between potential and kinetic energy?
8. What is the difference between a “calorie” and a “Calorie”?
9. What is the conversion from calorie to joule?
10. John consumed a hamburger on a bun that had 30g protein, 10 grams fat, and 28 grams of carbs. How many Calories did he consume?