Chapter 3
Study Guide

Name: _____

Date: _____ Per: _____

1. Define an atom: _____
2. Define an element: _____
3. Who first proposed the concept of atoms? _____
4. State the Law of Conservation of Matter: _____

   _____
5. State the Law of Definite Proportions: _____

   _____
6. State the Law of Multiple Proportions: _____

   _____
7. List the 5 postulates of Dalton's atomic theory.
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____
8. Describe a cathode ray tube: _____
9. Describe the people and processes by which the following were discovered.

Order of Discovery	**Discovery**	**Who**	**How/Process**
	Atomic Number		
	Charge of electron		
	Electron		
	Mass of electron		
	Nucleus		
	Neutron		
	Proton		
	Radioactivity		

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10. Fill in the table below about the 3 primary particles of an atom.

	Proton	**Neutron**	**Electron**
Location in Atom			
Charge			
Mass			

11. The number of protons in an atom is its _____.
12. An ion is an atom that has _____.
13. The force that holds the nucleus together is called the _____.
14. The force that causes the nucleus to be unstable is _____.
15. The mass number of an atom is equal to _____.
16. The atomic mass unit is based on the mass of _____.
17. The _____ accounts for almost all of the atom's mass but very little of its volume.
18. The _____ accounts for almost all of the atom's volume but very little of its mass.
19. Isotopes of an element have the same number of _____, but varying numbers of _____.
20. Define nuclide: _____
21. Complete the following – fill in the isotopic formula or the numbers of particles.

	# p^+	# n^0	# e^-		# p^+	# n^0	# e^-		# p^+	# n^0	# e^-		# p^+	# n^0	# e^-		# p^+	# n^0	# e^-
a.	8	10	8	b.				c.	25	32	22	d.				e.	80	119	78
					$^{45}_{22}Ti^{4+}$								$^{14}_{6}C$						

22. Fill in the table below for the unknown elements.

Isotope	Atomic Number	Mass Number	Number of Protons	Number of Neutrons	Number of Electrons	Charge
X			20	22		+2
Z		38		20	18	
R	3	6				+1
T		14		8		-4

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23. What is the relationship between the number of protons in an atom and the atom's identity? _____

_____

24. The atomic mass of an atom is found by taking the weighted average of _____.

25. The formula for determining the atomic mass of an element is:

26. Gallium has two naturally occurring isotopes. The mass of gallium-69 is 68.9256 u and it is 60.108% abundant. The mass of gallium-71 is 70.9247 u and it is 39.892% abundant. Find the atomic mass of gallium.

27. Antimony has two naturally occurring isotopes. The mass of antimony-121 is 120.904 u and the mass of antimony-123 is 122.904 u. Using the average mass from the periodic table, find the abundance of each isotope. (Remember that the sum of the two abundances must be 100).

28. What is the difference between a formula mass and a molar mass? _____

_____

29. Determine the following:
    a. the number of moles of aluminum in 35.5 grams of aluminum.

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b. the number of moles of gold in 5.60×10^{24} atoms of gold.

c. the number of moles of sodium in 45.6 grams of sodium.

d. the number of atoms of carbon in 37.9 grams of carbon.

e. the mass of 2.1×10^{29} atoms of neon.

f. the mass of 5.10×10^{25} atoms of xenon.

g. the mass of 3.450 moles of magnesium.

h. the mass of 2.3 moles of manganese.