General Chemistry - Unit 1 (Part 1) Review WS - ANSWERS

Directions: Complete the following questions on a separate piece of paper.

LT #2: Understand the experiments and the historical theories that lead to the modern atomic theory.

Describe Dalton's beliefs about the atom and chemical reactions with atoms.

All elements are composed of atoms; all atoms of a given element are identical, that atoms of different elements are different; chemical compounds are formed when atoms combine; atoms are not created or destroyed in chemical reactions (indivisible); solid sphere.

Describe the atom according to Thomson's theory.

Thomson found that the atom consisted of a positive mass but there were negative pieces scattered throughout the positive area (Plum Pudding Model). He discovered the electron (negatively charged).

Describe Rutherford's gold foil experiment. How did he change the model of the atom after the experiment?
Rutherford discovered the nucleus contained protons by shooting alpha particles (+) through gold
foil. He found that most went through but some bounced back. He found the nucleus, which is very,
very small and dense is found in the center of the atom, with the electrons around the outside.

4. What did Chadwick change about the atomic model? Chadwick (along with the Curies) found that the nucleus also contained the neutrons, which have approximately the same mass as the proton, but have no charge.

LT #3: Understand how subatomic particles determine the properties of an atom or ion.

5. List the three subatomic particles, their location, their charge and their relative mass.

Proton—found in nucleus, + charge, 1 amu (atomic mass unit)

Neutron—found in nucleus, no charge, 1 amu

Electron—cloud surrounding the nucleus, - charge, approx. no mass

6. a. What is a cation and how is it formed?

A cation is a positive ion and is formed when an atom loses one or more electrons.

b. What is an anion and how is it formed?

An anion is a negative ion and is formed when an atom gains one or more electrons.

7. Complete the following charts for atoms and ions:

MOTA	ISOTOPE SYMBOL	ATOMIC	MASS	#PROTONS	#ELECTRONS	#NEUTRONS
Sodium - 23	23 Mar	11	23	11	1.1	12
Aluminum - 27	IN AL	13	27	13	13	14
Chlorine - 35	38 C	17	35	17	17	18
Barium - 136	54 Ba	5-6	136	56	56	80

SYMBOL	MASS	#PROTONS	#ELECTRONS	#NEUTRONS	NET CHARGE	
K**	39	19	18	20	+1	
Br ⁻¹	80	35	36	45	-1	
Fers	56	26	23	30	+3	
Ser	79	34	36	45	-2	

8. Are all atoms of the same element identical? If not, how can they differ?

No; isotopes differ by # of neutrons. (Isotopes have the same # of protons and electrons.)

 Which of lead's four isotopes is most abundant: lead-204, lead-206, lead-207 or lead-208? Explain how you know which isotope is more abundant. The average atomic mass for lead is 207.2 amu; therefore, the most abundant isotope is lead-207

LT #4: Apply the mole concept (molar mass, mole equalities, conversions/dimensional analysis).

- 10. Calculate the molar mass of each of the following atoms or compounds:
 - a. zinc 65.4 g/mol

barium phosphate, Ba₃(PO₄)₂
3(137.3) + 2(31.0) + 8(16.0) = 601.9 g/mol

Modeling Chemistry U6 Wsv2 0 Answers

Katrin Zwirglmaier

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