Chapter 02 - Atoms, Molecules, and Ions

1. According to the law of definite proportions,
   a. the ratio of the masses of the elements in a compound is always the same.
   b. it is not possible for the same two elements to form more than one compound.
   c. if the same two elements form two different compounds, they do so in the same ratio.
   d. the total mass after a chemical change is the same as before the change.

ANSWER: a
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.2
KEYWORDS: compound | general chemistry | general concepts | matter

2. Which of the following pairs of compounds can be used to illustrate the law of multiple proportions?
   a. CaO and $CaCl_2$
   b. NO and NO_2
   c. H_2S and HBr
   d. SiH_4 and SiO_2
   e. NF_3 and NCl_3

ANSWER: b
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.2
KEYWORDS: compound | general chemistry | general concepts | matter

3. How many of the following did Dalton *not* discuss in his atomic theory?
I. isotopes
II. ions
III. protons
IV. neutrons
V. electrons
   a. 2
   b. 5
   c. 4
   d. 1
   e. 3

ANSWER: b
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.3
KEYWORDS: atomic theory of matter | Dalton's atomic theory | early atomic theory | general chemistry

4. When 2.0 L of oxygen gas (O_2) reacts with 1.0 L of nitrogen gas (N_2), 2.0 L of gaseous product is formed.

All volumes of gases are measured at the same temperature and pressure. What is the formula of the product?

a. NO

b. NO_4

c. N_2O_3

d. N_2O

e. NO_2

ANSWER: e
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.4
KEYWORDS: chemical formula | chemical substance | early atomic theory | general chemistry | molecular substance

5. Which one of the following statements about atomic structure is false?

a. Almost all of the mass of the atom is concentrated in the nucleus.

b. The protons and neutrons in the nucleus are very tightly packed.

c. The number of protons and the number of neutrons are always the same in the neutral atom.

d. The electrons occupy a very large volume compared to the nucleus.

ANSWER: c
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.4
2.5
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | nuclear structure

6. Which of the experiments listed below did *not* provide the information stated about the nature of the atom?

a. The Rutherford experiment proved that the Thomson "plum pudding" model of the atom was essentially correct.

b. The Rutherford experiment determined the charge on the nucleus.

c. The cathode-ray tube proved that electrons have a negative charge.

d. Millikan's oil-drop experiment showed that the charge on any particle was a simple multiple of the charge on the electron.

ANSWER: a
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.5
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | structure of the atom

7. Which of the following atomic symbols is incorrect?

a. $^{31}_{15}P$

b. $^{19}_{9}F$

c. $^{34}_{17}Cl$

d. $^{39}_{19}K$

e. $^{15}_{8}C$

ANSWER: e
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.5
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

8. The element rhenium (Re) exists as two stable isotopes and 18 unstable isotopes. Rhenium-185 has in its nucleus

a. 75 protons, 110 neutrons.

b. 75 protons, 75 neutrons.

c. 75 protons, 130 neutrons.

d. 130 protons, 75 neutrons.

e. not enough information is given.

ANSWER: a
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.5
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

9. Which of the following statements is(are) true?

I. O and F have the same number of neutrons.

II. C and N are isotopes of each other because their mass numbers are the same.

III. O^{2-} has the same number of electrons as Ne.

a. I only

b. II only

c. III only

d. I and II only

e. I and III only

ANSWER: c
POINTS: 1
DIFFICULTY: moderate
TOPICS: 2.5
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

10. Which among the following represent a set of isotopes? Atomic nuclei containing

I. 20 protons and 20 neutrons.

II. 21 protons and 19 neutrons.

III. 22 neutrons and 18 protons.
IV. 20 protons and 22 neutrons.
V. 21 protons and 20 neutrons.

a. I, V
b. III, IV
c. I, II, III
d. I, IV and II, V
e. No isotopes are indicated.

ANSWER: d
POINTS: 1
DIFFICULTY: moderate
TOPICS: 2.5
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

11. How many protons, neutrons, and electrons does the atom ^{39}K have?

a. 20 protons, 19 neutrons, 20 electrons
b. 19 protons, 19 neutrons, 39 electrons
c. 20 protons, 20 neutrons, 19 electrons
d. 19 protons, 19 neutrons, 19 electrons
e. 19 protons, 20 neutrons, 19 electrons

ANSWER: e
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.6
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

12. An ion is formed

I. by either adding protons to or subtracting protons from the atom.
II. by either adding electrons to or subtracting electrons from the atom.
III. by either adding neutrons to or subtracting neutrons from the atom.

a. Only I is true.
b. Only II is true.
c. Only III is true.
d. All of the statements are true.
e. Two of the statements are true.

ANSWER: b
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.6
KEYWORDS: chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance

13. Which is the symbol for the isotope of nitrogen that has 7 protons and 8 neutrons?

a. $^{7}_{8}\mathrm{N}$

b. $^{7}_{15}\mathrm{N}$

c. $^{8}_{7}\mathrm{N}$

d. $^{15}_{7}\mathrm{N}$

ANSWER: d
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.6
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

14. Which of the following represents a pair of isotopes?

a. $^{15}_{7}\mathrm{N}$, $^{15}_{8}\mathrm{O}$

b. $^{1}_{1}\mathrm{H}$, $^{2}_{1}\mathrm{H}$

c. $^{14}_{7}\mathrm{N}$, $^{15}_{8}\mathrm{O}$

d. $^{31}_{15}\mathrm{P}$, $^{31}_{15}\mathrm{P}^{3-}$

e. $^{\mathrm{C}}$, $^{\mathrm{C}}_{60}$

ANSWER: b
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.6
2.7
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

15. Which of the following statements is(are) true?

I. The number of protons is the same for all neutral atoms of an element.
II. The number of electrons is the same for all neutral atoms of an element.
III. The number of neutrons is the same for all neutral atoms of an element.

a. I, II, and III are all true.

b. I, II, and III are all false.

c. Only I and II are true.

d. Only I and III are true.

e. Only II and III are true.

ANSWER: c
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.6
2.7
KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

16. The ion $^{14}N^{3-}$ has
    a. 7 protons, 7 neutrons, 4 electrons
    b. 7 protons, 7 neutrons,3 electrons
    c. 7 protons, 14 neutrons, 7 electrons
    d. 7 protons, 7neutrons, 10 electrons
    e. 7 protons, 7 neutrons, 7 electrons

ANSWER: d
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.6
2.9
KEYWORDS: chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance

17. The ion $^{127}I^-$ has
    a. 53 protons, 74 neutrons, 52 electrons
    b. 53 protons, 74 neutrons, 54 electrons
    c. 53 protons, 53 neutrons, 53 electrons
    d. 53 protons, 74 neutrons, 53 electrons
    e. 53 protons, 127 neutrons, 54 electrons

ANSWER: b
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.6
2.9
KEYWORDS: chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance

18. An element's most stable ion forms an ionic compound with chlorine having the formula XCl_2. If the mass number of the ion is 89 and it has 36 electrons, what is the element and how many neutrons does it have?
    a. Sr, 51 neutrons
    b. Kr, 55 neutrons
    c. Se, 55 neutrons
    d. Kr, 53 neutrons
    e. Rb, 52 neutrons

ANSWER: a
POINTS: 1
DIFFICULTY: moderate
TOPICS: 2.6
2.9

KEYWORDS: chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance

19. Which element does *not* belong to the family or classification indicated?
    a. Br, halogen
    b. Na, alkali metal
    c. As, lanthanides
    d. He, noble gas
    e. Ru, transition metal

ANSWER: c
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.7
2.8
KEYWORDS: early atomic theory | general chemistry | periodic table

20. Which are alkaline earth halides?
    a. MgO, MgS, CaO
    b. NaI, KBr, LiF
    c. CaF_2, $MgBr_2$, SrI_2
    d. Al_2O_3, In_2O_3, Ga_2S_3
    e. PbI_2, $PbBr_2$, CdF_2

ANSWER: c
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
2.9
KEYWORDS: early atomic theory | general chemistry | periodic table

21. Select the group of symbols that would correctly complete the following statements, respectively.
___ is the heaviest noble gas.
___ is the transition metal that has 24 electrons as a 3+ ion.
___ is the halogen in the third period.
___ is the alkaline earth metal that has 18 electrons as a stable ion.
    a. Rn, Cr, Br, Ca
    b. Ra, Sc, Br, K
    c. Ra, Co, Cl, K
    d. Rn, Co, Cl, Ca

ANSWER: d
POINTS: 1
DIFFICULTY: moderate
TOPICS: 2.8

2.9

KEYWORDS: early atomic theory | general chemistry | periodic table

22. _____ form ions with a 2+ charge when they react with nonmetals.

a. Halogens
b. Noble gases
c. Alkaline earth metals
d. Alkali metals
e. None of these choices

ANSWER: c
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: early atomic theory | general chemistry | group | periodic table

23. Which of the following formulas is *not* correct?

a. $Ba(OH)_2$
b. LiS
c. NaI
d. KCl
e. $MgSO_3$

ANSWER: b
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance

24. Which of the following is *not* the correct chemical formula for the compound named?

a. Fe_2PO_4 iron(II) phosphate
b. $BaBr_2$ barium bromide
c. Li_2O lithium oxide
d. HF hydrogen fluoride
e. Mg_3N_2 magnesiumnitride

ANSWER: a
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

25. Which of the following is *not* the correct name for the formula given?
    a. $HClO$ hypochlorus acid
    b. Cr_2S_3 chromium(III)sulfide
    c. PCl_5 phosphoruspentachloride
    d. CoO cobalt(II) oxide
    e. $CaSO_3$ calciumsulfate

ANSWER: e
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

26. Which is *not* the correct chemical formula for the compound named?
    a. iron(II) oxide FeO
    b. potassium sulfate K_2SO_4
    c. sodium sulfide NaS
    d. zinc nitrate $Zn(NO_3)_2$
    e. calcium carbonate $CaCO_3$

ANSWER: c
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

27. What is the correct formula for barium phosphate?
    a. Ba_2PO_4
    b. $Ba_3(PO_4)_2$
    c. $Ba_2(PO_4)_3$
    d. Ba_3PO_4
    e. $BaPO_4$

ANSWER: b
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

28. Which of the following is *not* the correct chemical formula for the compound named?

a. HF hydrogen fluoride
b. MgO magnesium oxide
c. Fe_3PO_4 iron(III) phosphate
d. Li_2O lithium oxide
e. $BaCl_2$ barium chloride

ANSWER: c
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

29. Which formula is *not* correct?
a. LiF
b. $Ca(NO_2)_2$
c. $AlCl_2$
d. $NaC_2H_3O_2$
e. MgS

ANSWER: c
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.9
KEYWORDS: chemical formula | chemical substance | early atomic theory | general chemistry | ionic substance

30. What is the correct formula for lead(IV) oxide?
a. PbO_4
b. PbO_3
c. PbO
d. Pb_4O
e. PbO_2

ANSWER: e
POINTS: 1
DIFFICULTY: moderate
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

31. Which of the following is *not* the correct name for the formula given?
a. PCl_5 phosphorus pentachoride

b. Fe_2O_3 iron(III) oxide
c. HClO hypochlorous acid
d. $BaSO_3$ barium sulfate
e. CoO cobalt(II) oxide

ANSWER: d
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

32. Which of the following is *not* the correct chemical formula for the compound named?

a. $Na(OH)_2$ sodium hydroxide
b. $Mg(C_2H_3O_2)_2$ magnesium acetate
c. ZnS zinc sulfide
d. Fe_2O_3 iron(III) oxide
e. KCN potassium cyanide

ANSWER: a
POINTS: 1
DIFFICULTY: moderate
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

33. Which is the correct formula for copper(I) oxide?

a. CuO
b. CuO_2
c. Cu_2O_2
d. Cu_2O
e. Cu_2O_3

ANSWER: d
POINTS: 1
DIFFICULTY: moderate
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

34. Complete the following table.

Symbol	Number of	Number of	Number of	Net

	Protons	Neutrons	Electrons	Charge
$^{206}_{82}Pb$				
	31	38		3+
	52	75	54	
$^{54}_{25}Mn^{2+}$		29		2+

ANSWER:

Symbol	Number of Protons	Number of Neutrons	Number of Electrons	Net Charge
$^{206}_{82}Pb$	82	124	82	0
$^{69}_{31}Ga^{3+}$	31	38	28	3+
$^{127}_{52}Te^{2-}$	52	75	54	2–
$^{54}_{25}Mn^{2+}$	25	29	23	2+

POINTS: 1

DIFFICULTY: difficult

TOPICS: 2.6
2.7

KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

35. Complete the following table.

Symbol	**$^{56}Fe^{2+}$**	
Number of protons		35
Number of neutrons		45
Number of electrons		
Atomic number		
Mass number		
Net charge		1-

ANSWER:

Symbol	$^{56}Fe^{2+}$	**$^{80}Br^{-}$**
Number of protons	26	35
Number of neutrons	30	45
Number of electrons	24	36
Atomic number	26	35
Mass number	56	80
Net charge	2+	1-

POINTS: 1

DIFFICULTY: difficult

TOPICS: 2.6
2.7

KEYWORDS: atomic theory of matter | early atomic theory | general chemistry | isotope

Name the following compounds:

36. $Al_2(SO_4)_3$
ANSWER: aluminum sulfate
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

37. NH_4NO_3
ANSWER: ammonium nitrate
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

38. NaH
ANSWER: sodium hydride
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

39. $K_2Cr_2O_7$
ANSWER: potassium dichromate
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

40. CCl_4
ANSWER: carbon tetrachloride
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: binary molecular compound | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

41. AgCl
ANSWER: silver chloride

POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

42. $CaSO_4$
ANSWER: calcium sulfate
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

43. HNO_3
ANSWER: nitric acid
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

44. N_2O_3
ANSWER: dinitrogen trioxide
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: binary molecular compound | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

45. SnI_2
ANSWER: tin(II) iodide
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

Write the formula for:

46. sodium dichromate
ANSWER: $Na_2Cr_2O_7$

POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

47. iron(III) oxide
ANSWER: Fe_2O_3
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

48. dinitrogen trioxide
ANSWER: N_2O_3
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: binary molecular compound | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

49. cobalt(II) chloride
ANSWER: $CoCl_2$
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

50. aluminum hydroxide
ANSWER: $Al(OH)_3$
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

51. hydrosulfuric acid
ANSWER: H_2S
POINTS: 1
DIFFICULTY: easy

TOPICS: 2.8
KEYWORDS: acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

52. sulfurous acid
ANSWER: H_2SO_3
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

53. nitric acid
ANSWER: HNO_3
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

54. phosphoric acid
ANSWER: H_3PO_4
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

55. acetic acid
ANSWER: $HC_2H_3O_2$
POINTS: 1
DIFFICULTY: easy
TOPICS: 2.8
KEYWORDS: acid | chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

56. Write the chemical formulas for the following compounds or ions.

a) nitrate ion _____
b) aluminum oxide _____
c) ammonium ion _____
d) perchloric acid _____
e) copper(II) bromide _____

ANSWER: a) NO_3^-
b) Al_2O_3
c) NH_4^+
d) $HClO_4$
e) $CuBr_2$
POINTS: 1
DIFFICULTY: moderate
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | nomenclature of simple compound

57. Write the names of the following compounds:

a) $FeSO_4$ _____
b) $NaC_2H_3O_2$ _____
c) KNO_2 _____
d) $Ca(OH)_2$ _____
e) $NiCO_3$ _____

ANSWER: a) iron(II) sulfate
b) sodium acetate
c) potassium nitrite
d) calcium hydroxide
e) nickel(II) carbonate
POINTS: 1
DIFFICULTY: moderate
TOPICS: 2.9
KEYWORDS: chemical substance | early atomic theory | general chemistry | ionic compound | nomenclature of simple compound

58. Which nuclide has more protons than neutrons?

a. $^{53}_{26}Fe$
b. $^{37}_{19}K$
c. $^{60}_{27}Co$
d. $^{57}_{28}Ni$

ANSWER: a
POINTS: 1

59. An isotope of an element is formed

I. by adding protons to, or removing protons from, the atom.
II. by adding neutrons to, or removing neutrons from, the atom.
III. by adding electrons to, or removing electrons from, the atom.

a. Only I is true
b. Only II is true
c. Only III is true
d. All of the statements are true
e. Two of the statements are true

ANSWER: b
POINTS: 1

60. Which statement or statements regarding Antoine Lavoisier and his discovery of the conservation of mass in chemical reactions must be false.

a. Lavoisier conducted his experiment in an apparatus that trapped all reaction products.
b. Lavoisier was able to make accurate mass measurements.
c. Lavoisier was able to make precise mass measurements.
d. Lavoisier did not trap gases in his experiments because their mass was negligible.
e. A and D

ANSWER: d
POINTS: 1

61. The experiments of what two scientists were instrumental in determining the mass and charge of the electron?

a. Lavoisier and Dalton
b. Rutherford and Curie
c. Thompson and Rutherford
d. Millikan and Cannizzaro
e. Thompson and Millikan

ANSWER: e
POINTS: 1

62. Which of the following gases was discovered by Joseph Priestley?

a. Neon gas
b. Oxygen gas
c. Methane gas
d. Ammonia gas
e. Helium gas

ANSWER: b
POINTS: 1
DIFFICULTY: Easy
TOPICS: 2.1
KEYWORDS: general chemistry

63. _____ proposes that, at the same temperature and pressure, equal volumes of different gases contain the same number of particles.

a. Charles' hypothesis
b. Dalton's hypothesis
c. Boyle's hypothesis
d. Avogadro's hypothesis
e. Bergsman's hypothesis

ANSWER: d
POINTS: 1
DIFFICULTY: Easy
TOPICS: 2.3
KEYWORDS: general chemistry

64. Identify the true statement(s).
1. An ion is an atom or group of atoms that has a net positive or negative charge.
2. An ion with positive charge is called cation.
3. An ion with negative charge is called anion.

a. 1 only
b. 2 only
c. 3 only
d. 2 and 3
e. 1, 2, and 3

ANSWER: e
POINTS: 1
DIFFICULTY: Easy
TOPICS: 2.7
KEYWORDS: general chemistry

65. The relative molecular mass of a compound containing only carbon and hydrogen is 114. The compound contains 84% of carbon by mass. Predict the formula of the compound.

ANSWER: C_8H_{18}
POINTS: 1
DIFFICULTY: Moderate
TOPICS: 2.4
KEYWORDS: general chemistry

66. The relative mass of a compound containing carbon, hydrogen, and oxygen is 180. The mass percentage of carbon and hydrogen in the compound is 40% and 6.7%, respectively. Determine the formula of the compound.

ANSWER: $C_6H_{12}O_6$
POINTS: 1
DIFFICULTY: Moderate
TOPICS: 2.4
KEYWORDS: general chemistry

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