Kingdom of Saudi Arabia
Ministry of Education
Taibah University
Unified Scientific Track

Studetn Name:

Student ID:

Section No.:

INTRODUCTION TO CHEMISTRY (CHEM 101)

Assessment on Chapter 03 - Topic 08

1. Which of these is an "empirical formula"?

❑ a. C_2H_6 ❑ b. H_2O_2 ❑ c. NO_2 ❑ d. N_2O_4

2. The empirical formula for C_6H_{12} is ………………..

❑ a. C_2H_4 ❑ b. CH_3 ❑ c. C_3H_6 ❑ d. CH_2

3. Molecular shapes are shown with ……………. formulas.

❑ a. structural ❑ b. molecular ❑ c. empirical ❑ d. chemical

4. All of the following elements are diatomic, except ……………

❑ a. Hydrogen ❑ b. Nitrogen ❑ c. Sulfur ❑ d. Chlorine

5. Four of the diatomic elements are in the family known as ……………

❑ a. Alkali metals ❑ b. Alkaline earth metals ❑ c. Chalcogens ❑ d. Halogens

6. In ionic bonds, electrons are …………………

❑ a. transferred to the metal ❑ b. transferred to the nonmetal

❑ c. shared between two nonmetals ❑ d. shared between two metals

7. A double covalent bond equals ………. shared electrons.

❑ a. 1 ❑ b. 2 ❑ c. 3 ❑ d. 4

8. Sodium (Na) forms covalent bonds.

❑ a. True ❑ b. False

9. Elements and compounds are classified as:

❑ a. mixtures ❑ b. ionic substances ❑ c. pure substances ❑ d. molecular substances

10. Which pair of elements should form an ionic compound?

❑ a. Mg and Ca ❑ b. K and S ❑ c. N and O ❑ d. P and Cl

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INTRODUCTION TO CHEMISTRY (CHEM 101)

Assessment on Chapter 03 - Topic 09

1. Calcium and oxygen in a compound should have the formula:

❑ a. Ca_2O ❑ b. CaO   ❑c. CaO_2 ❑ d. Ca_2O_2

2. Carbon tetrafluoride should have the formula …………………..

❑ a. CF_4 ❑ b. CF   ❑c. C_4F ❑ d. CF_2

3. The compound obtained from the reaction of aluminum with nitrogen has the formula ……

❑ a. Al_3N_3 ❑ b. Al_3N ❑c. AlN_3 ❑ d. AlN

4. Na_2O is the formula for which compound?

❑ a. sodium oxide   ❑ b. sodium (I) oxide   ❑c. sodium(II) oxide   ❑ d. sodium oxate

5. The correct name for the acid HI is …………….. acid.

❑ a. hydrogen iodate   ❑ b. Hydroiodic   ❑c. hydrogen iodite   ❑ d. hydrogen iodide

6. The compound H_2S is named "sulfuric acid".

❑ a. True   ❑ b. False

7. SO_4^{2-} is a polyatomic ion.

❑ a. True   ❑ b. False

8. Which pair of elements should form a molecular compound?

❑ a. Na and Br   ❑ b. Fe and Cl   ❑c. S and O   ❑ d. K and Ca

9. Which of the following is a polyatomic ion?

❑ a. S^{2-} ❑ b. O_3 ❑c. OH^- ❑ d. Al^{3+}

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INTRODUCTION TO CHEMISTRY (CHEM 101)

Assessment on Chapter 03 - Topic 10

1. One mole of gold (MM = 197) has the same mass as one mole of carbon (MM = 12).

❏ a. True ❏ b. False

2. Potassium's atomic number is 19 and its atomic weight is 39.1, so its molar mass is …… g/mol.

❏ a. 19 ❏ b. 20.1 ❏ c. 39.1 ❏ d. 78.2

3. Element X as a molar mass of 30 g/mol, and element Y has a molar mass of 50 g/mol. Which of the following has the highest number of moles?

❏ a. 30 g of X ❏ b. 50 g of X ❏ c. 30 g of Y ❏ d. 50 g of Y

4. 160 g of an element with a molar mass of 40 g/mol equals ……… moles?

❏ a. 0.25 ❏ b. 4 ❏ c. 120 ❏ d. 200

5. If 50 g of one element = 2.5 moles, then 50 g of every element = 2.5 moles.

❏ a. True ❏ b. False

6. Sodium has a molar mass of 23.0 g/mol, and lead has a molar mass of 207.2 g/mol, so 3.5 moles of sodium has the same number of atoms as 3.5 moles of lead.

❏ a. True ❏ b. False

7. Which of the following would have the highest number of atoms in a 100 g sample?

❏ a. copper with a molar mass of 63.5 g/mol ❏ b. calcium with a molar mass of 40.1 g/mol

❏ c. aluminum with a molar mass of 27.0 g/mol ❏ d. sodium with a molar mass of 23.0 g/mol

8. An actual mass of 120 g of an element whose molar mass is 40 g/mol would be ………. atoms?

❏ a. 2.007×10^{23} ❏ b. 1.8066×10^{23} ❏ c. c. 2.007×10^{24} ❏ d. 1.8066×10^{24}

9. The equation for finding the number of moles is ………………

❏ a. n = m/MM ❏ b. m = n/MM ❏ c. n = m×MM ❏ d. MM = n/m

10. How many atoms of hydrogen are there in a molecule of $(NH_4)_2CO_3$?

❑ a. 2   ❑ b. 4   ❑ c. 6   ❑ d. 8

11. Avogadro's number equals ………………

❑ a. 2.066×10^{23} ❑ b. 6.022×10^{23} ❑ c. 6.025×10^{24} ❑ d. 6.023×10^{22}

12. In 4.5 moles of K_2S, there are ………… moles of K ions.

❑ a. 9   ❑ b. 4.5   ❑ c. 13.5   ❑ d. 18

13. If 5 moles of an element are weighing 95 g, this element is most likely …………….

❑ a. Fluorine   ❑ b. Oxygen   ❑ c. Iron   ❑ d. Carbon

14. Five moles of any substance contains …………. particles.

❑ a. 9.2×10^{23} ❑ b. 3.011×10^{24} ❑ c. 6.022×10^{25} ❑ d. 5.5×10^{23}

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INTRODUCTION TO CHEMISTRY (CHEM 101)

Assessment on Chapter 03 - Topic 11

1. The compound $Ca(NO_3)_2$ has a molar mass of …….. g/mol.

❑ a. 70.1   ❑ b. 10.2   ❑ c. 116.1   ❑ d. 164.1

2. The formula $[3(NH_4)_2CO_3]$ has a total of …….. hydrogens.

❑ a. 8   ❑ b. 16   ❑ c. 22   ❑ d. 24

3. In C_3H_7COOH, carbon's mass percentage composition is …….%.

❑ a. 40.9   ❑ b. 54.5   ❑ c. 62.5   ❑ d. 95.5

4. $(NH_4)_2CO_3$ has a molar mass of 96.0 g/mol. Nitrogen's composition is 29.2%, hydrogen's is 8.3%, and carbon's is 12.5%. What is the percentage composition for oxygen?

❑ a. 36 %   ❑ b. 37.5 %   ❑ c. 48 %   ❑ d. 50 %

5. Which compound has the highest mass percentage composition of carbon?

❑ a. CH_4 ❑ b. C_3H_8 ❑ c. $C_3H_6O_2$ ❑ d. $C_4H_8O_2$

6. A compound has an empirical formula of NO_2 and a molar mass of 138, so its molecular formula is …..…

❑ a. NO_2 ❑ b. N_2O_4 ❑ c. NO_3 ❑ d. N_3O_6

7. C_2H_4 and C_3H_6 have the same empirical formula.

❑ a. True   ❑ b. False

8. The empirical formula for C_4H_{10} is CH_5.

❑ a. True   ❑ b. False

9. If a compound has an empirical formula of CH_2O and a molar mass of 150 g/mol, its molecular formula is $C_5H_{10}O_5$.

❑ a. True   ❑ b. False

10. After balancing the equation: $K + O_2 \rightarrow K_2O$ the coefficient for K will be ……………….

❑ a. 1   ❑ b. 2   ❑ c. 3   ❑ d. 4

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INTRODUCTION TO CHEMISTRY (CHEM 101)

Assessment on Chapter 03 - Topic 12

1. How many bonding pairs of electrons are there in one molecule of ammonia (NH_3)?

❏ a. 2 ❏ b. 3 ❏ c. 1 ❏ d. 5 ❏ e. 0

2. How many bonding pairs of electrons are there in one molecule of water?

❏ a. 0 ❏ b. 1 ❏ c. 2 ❏ d. 4 ❏ e. 6

3. How many lone pairs of electrons are present around the central atom in the ammonium ion?

❏ a. 1 ❏ b. 4 ❏ c. 0 ❏ d. 16 ❏ e. 12

4. How many lone pairs of electrons are there in sulfur atom of SO_2?

❏ a. 2 ❏ b. 3 ❏ c. 1 ❏ d. 6 ❏ e. 0

5. The patterns for electronegativity in the periodic table are the same as the patterns for ionization energy.

❏ a. True ❏ b. False

6. The most electronegative element is fluorine.

❏ a. True ❏ b. False

7. Which is the strongest bond?

❏ a. C–H ❏ b. C–C ❏ c. C=C ❏ d. C≡C

8. Long bonds are usually ……………

❏ a. strong ❏ b. weak ❏ c. triple ❏ d. stable

9. Which of the following should be the shortest bond?

❏ a. C–C ❏ b. C≡C ❏ c. O=O ❏ d. C=C

10. Triple bonds tend to be …………..

❏ a. short and weak ❏ b. long and weak ❏ c. long and strong ❏ d. short and strong