

Name: \_\_\_\_\_

Assignment: Q2 Exam Review

1 Answer \_\_\_\_\_

Carbon monoxide and carbon dioxide have

- A the same chemical properties and the same physical properties
- B the same chemical properties and different physical properties
- C different chemical properties and the same physical properties
- D different chemical properties and different physical properties

2 Answer \_\_\_\_\_

Which statement describes the charge distribution and the polarity of a CH<sub>4</sub> molecule?

- A The charge distribution is symmetrical and the molecule is nonpolar.
- B The charge distribution is asymmetrical and the molecule is nonpolar.
- C The charge distribution is symmetrical and the molecule is polar.
- D The charge distribution is asymmetrical and the molecule is polar

3 Answer \_\_\_\_\_

An atom of which element reacts with an atom of hydrogen to form a bond with the greatest degree of polarity?

- A carbon
- B fluorine
- C nitrogen
- D oxygen

4 Answer \_\_\_\_\_

What is the chemical formula for ammonium sulfide?

- A (NH<sub>4</sub>)<sub>2</sub>S
- B (NH<sub>4</sub>)<sub>2</sub>SO<sub>3</sub>
- C (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>
- D (NH<sub>4</sub>)<sub>2</sub>S<sub>2</sub>O<sub>3</sub>

5 Answer \_\_\_\_\_

Which formula is an empirical formula?

- A N<sub>2</sub>O<sub>4</sub>
- B NH<sub>3</sub>
- C C<sub>3</sub>H<sub>6</sub>
- D P<sub>4</sub>O<sub>10</sub>

Class/Period: \_\_\_\_\_

Teacher: Martin

6 Answer \_\_\_\_\_

Which phrase describes the molecular polarity and distribution of charge in a molecule of carbon dioxide, CO<sub>2</sub>?

- A polar and symmetrical
- B polar and asymmetrical
- C nonpolar and symmetrical
- D nonpolar and asymmetrical

7 Answer \_\_\_\_\_

Which element tends **not** to react with other elements?

- A helium
- B hydrogen
- C phosphorus
- D potassium

8 Answer \_\_\_\_\_

Which term represents the strength of the attraction an atom has for the electrons in a chemical bond?

- A electrical conductivity
- B electronegativity
- C first ionization energy
- D specific heat capacity

9 Answer \_\_\_\_\_

What is the number of moles of KF in a 29-gram sample of the compound?

- A 1.0 mol
- B 2.0 mol
- C 0.50 mol
- D 5.0 mol

10 Answer \_\_\_\_\_

Which bond is most polar?

- A C–O
- B H–O
- C N–O
- D S–O

11 Answer \_\_\_\_\_

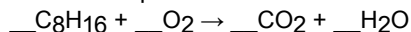
Given the equation:  $\_\_ \text{FeCl}_2 + \_\_ \text{Na}_2\text{CO}_3 \rightarrow \_\_ \text{FeCO}_3 + \_\_ \text{NaCl}$

When the equation is correctly balanced using the smallest whole numbers, the coefficient of NaCl is

- A 6
- B 2
- C 3
- D 4

**12 Answer \_\_\_\_\_**

When the equation



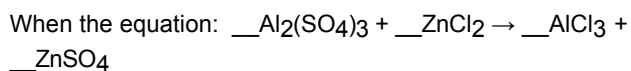
is correctly balanced using the smallest whole number coefficient, the coefficient of  $\text{O}_2$  is

- A 1
- B 8
- C 12
- D 16

**13 Answer \_\_\_\_\_**

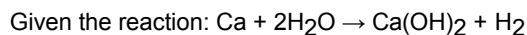
Which equation illustrates conservation of mass?

- A  $\text{H}_2 + \text{Cl}_2 \rightarrow \text{HCl}$
- B  $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$
- C  $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$
- D  $\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$

**14 Answer \_\_\_\_\_**

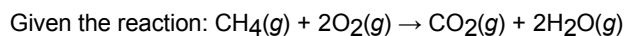
is correctly balanced using the smallest whole number coefficients, the sum of the coefficients is

- A 9
- B 8
- C 5
- D 4

**15 Answer \_\_\_\_\_**

What is the total number of moles of Ca needed to react completely with 4.0 moles of  $\text{H}_2\text{O}$ ?

- A 1.0
- B 2.0
- C 0.50
- D 4.0

**16 Answer \_\_\_\_\_**

How many moles of oxygen are needed for the complete combustion of 3.0 moles of  $\text{CH}_4(\text{g})$ ?

- A 6.0 moles
- B 2.0 moles
- C 3.0 moles
- D 4.0 moles

**17 Answer \_\_\_\_\_**

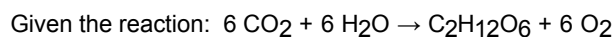
When the equation is balanced using the smallest whole-number coefficients, the ratio of moles of hydrogen consumed to moles of ammonia produced is

- A 1:3
- B 2:3
- C 3:1
- D 3:2

**18 Answer \_\_\_\_\_**

If an equation is balanced properly, both sides of the equation must have the same number of

- A atoms
- B coefficients
- C molecules
- D moles of molecules

**19 Answer \_\_\_\_\_**

What is the total number of moles of water needed to make 2.5 moles of  $\text{C}_2\text{H}_{12}\text{O}_6$ ?

- A 2.5
- B 6.0
- C 12
- D 15

**20 Answer \_\_\_\_\_**

What is the total number of moles of atoms contained in 1 mole of  $\text{NH}_3$ ?

- A 1 mole
- B 2 moles
- C 3 moles
- D 4 moles

**21 Answer \_\_\_\_\_**

What is conserved during a chemical reaction?

- A mass, only
- B charge, only
- C both mass and charge
- D neither mass nor charge

**22 Answer \_\_\_\_\_**

What is the percent composition by mass of aluminum in  $\text{Al}_2(\text{SO}_4)_3$  (gram-formula mass = 342 grams/mole)?

- A 7.89%
- B 15.8%
- C 20.8%
- D 36.0%

**23 Answer** \_\_\_\_\_

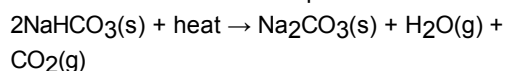
Which chemical equation is correctly balanced?

- A  
 $\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{g})$   
 B  
 $\text{N}_2(\text{g}) + \text{H}_2(\text{g}) \rightarrow \text{NH}_3(\text{g})$   
 C  
 $2\text{NaCl}(\text{s}) \rightarrow \text{Na}(\text{s}) + \text{Cl}_2(\text{g})$   
 D  
 $2\text{KCl}(\text{s}) \rightarrow 2\text{K}(\text{s}) + \text{Cl}_2(\text{g})$

**24 Answer** \_\_\_\_\_**Figure 1**

Base your answer to the question on the information below.

Some dry chemicals can be used to put out forest fires. One of these chemicals is  $\text{NaHCO}_3$ . When  $\text{NaHCO}_3(\text{s})$  is heated, one of the products is  $\text{CO}_2(\text{g})$ , as shown in the balanced equation below.

**Refer to Figure 1 and answer the following Question:**

Which is a correct numerical setup for calculating the percent composition by mass of carbon in the product  $\text{Na}_2\text{CO}_3$ ?

- A  $\frac{12}{23+12+16} \times 100$   
 B  $\frac{24}{23+(2 \times 12)+(3 \times 16)} \times 100$   
 C  $\frac{12}{(2 \times 23)+12+(3 \times 16)} \times 100$   
 D  $\frac{6}{(2 \times 23)+6+16} \times 100$

**25 Answer** \_\_\_\_\_

What is the formula mass of oxygen in  $\text{Fe}_2\text{O}_3$ ?

- A 16  
 B 32  
 C 48  
 D 60

**26 Answer** \_\_\_\_\_

What is the formula mass for sulfur dioxide,  $\text{SO}_2$ ?

- A 16  
 B 32  
 C 48  
 D 64

**27 Answer** \_\_\_\_\_

Given the incomplete equation:  $2\text{N}_2\text{O}_5 \rightarrow$

Which set of products completes and balances the incomplete equation?

- A  $2\text{N}_2 + 3\text{H}_2$   
 B  $2\text{N}_2 + 2\text{O}_2$   
 C  $4\text{NO}_2 + \text{O}_2$   
 D  $4\text{NO} + 5\text{O}_2$

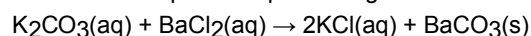
**28 Answer** \_\_\_\_\_

What is the chemical formula for lead(IV) oxide?

- A  $\text{PbO}_2$   
 B  $\text{PbO}_4$   
 C  $\text{Pb}_2\text{O}$   
 D  $\text{Pb}_4\text{O}$

**29 Answer** \_\_\_\_\_

Given the balanced equation representing a reaction:



Which type of reaction is represented by this equation?

- A synthesis  
 B decomposition  
 C single replacement  
 D double replacement

**30 Answer** \_\_\_\_\_

What is the mass of 1.5 moles of  $\text{CO}_2$ ?

- A 66 g  
 B 44 g  
 C 33 g  
 D 29 g

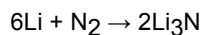
**31 Answer** \_\_\_\_\_

Which term identifies a type of chemical reaction?

- A decomposition  
 B distillation  
 C sublimation  
 D vaporization

**32 Answer** \_\_\_\_\_

Given the balanced equation representing a reaction:



Which type of chemical reaction is represented by this equation?

- A synthesis  
 B decomposition  
 C single replacement  
 D double replacement

33 Answer \_\_\_\_\_

What is the percent composition by mass of oxygen in  $\text{Ca}(\text{NO}_3)_2$  (gram-formula mass = 164 g/mol)?

- A 9.8%
- B 29%
- C 48%
- D 59%

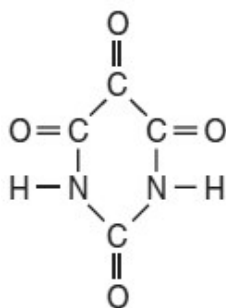
34 Answer \_\_\_\_\_

Which type of formula represents the simplest whole-number ratio of atoms of the elements in a compound?

- A molecular formula
- B condensed formula
- C empirical formula
- D structural formula

35 Answer \_\_\_\_\_

Given the formula for a compound:



Which molecular formula and empirical formula represent this compound?

- A  $\text{C}_2\text{HNO}_2$  and  $\text{CHNO}$
- B  $\text{C}_2\text{HNO}_2$  and  $\text{C}_2\text{HNO}_2$
- C  $\text{C}_4\text{H}_2\text{N}_2\text{O}_4$  and  $\text{CHNO}$
- D  $\text{C}_4\text{H}_2\text{N}_2\text{O}_4$  and  $\text{C}_2\text{HNO}_2$

36 Answer \_\_\_\_\_

The gram-formula mass of  $\text{NO}_2$  is defined as the mass of

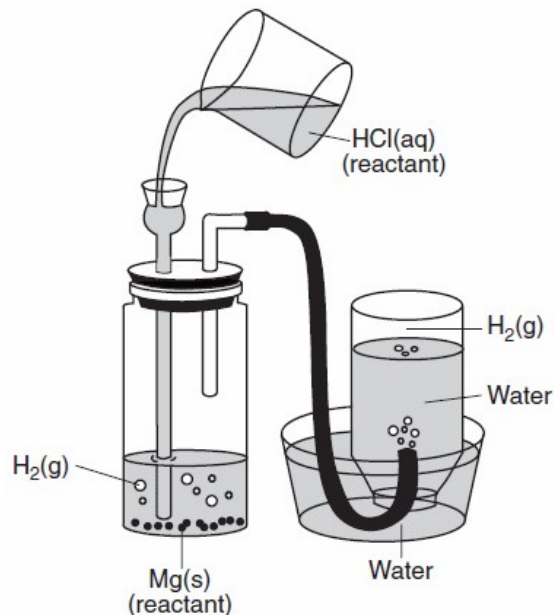
- A one mole of  $\text{NO}_2$
- B one molecule of  $\text{NO}_2$
- C two moles of  $\text{NO}$
- D two molecules of  $\text{NO}$

37 Answer \_\_\_\_\_

Figure 2

Base your answer to the question on the information below.

A student places a 2.50-gram sample of magnesium metal in a bottle and fits the bottle with a 2-hole stopper as shown in the diagram. Hydrochloric acid is added to the bottle, causing a reaction. As the reaction proceeds, hydrogen gas travels through the tubing to an inverted bottle filled with water, displacing some of the water in the bottle.



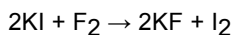
Refer to Figure 2 and answer the following Question:

What is the correct numerical setup for calculating the number of moles of magnesium used in the experiment?

- A  $24.3\text{g} \times 2.5\text{g} = x \text{ mol}$
- B  $24.3 \text{ g} \times \frac{1 \text{ mol}}{2.5 \text{ g}}$
- C  $2.50 \text{ g} \times \frac{24.3 \text{ g}}{1 \text{ mol}}$
- D  $2.50 \text{ g} \times \frac{1 \text{ mol}}{24.3 \text{ g}}$

38 Answer \_\_\_\_\_

Given the balanced equation:



Which type of chemical reaction does this equation represent?

- A synthesis
- B decomposition
- C single replacement
- D double replacement

**39 Answer \_\_\_\_\_**

Given the word equation:

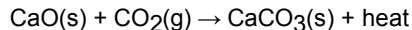


Which type of chemical reaction is represented by this equation?

- A double replacement
- B single replacement
- C decomposition
- D synthesis

**40 Answer \_\_\_\_\_**

Given the balanced equation representing a reaction:



What is the total mass of CaO(s) that reacts completely with 88 grams of CO<sub>2</sub>(g) to produce 200. grams of CaCO<sub>3</sub>(s)?

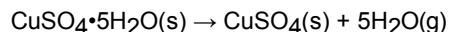
- A 56 g
- B 88 g
- C 112 g
- D 288 g

**41 Answer \_\_\_\_\_****Figure 3**

Base your answer to this question on the information below.

A hydrate is a compound that has water molecules within its crystal structure. The formula for the hydrate CuSO<sub>4</sub>•5H<sub>2</sub>O(s) shows that there are five moles of water for every one mole of CuSO<sub>4</sub>(s).

When CuSO<sub>4</sub>•5H<sub>2</sub>O(s) is heated, the water within the crystals is released, as represented by the balanced equation below.



A student first masses an empty crucible (a heat-resistant container). The student then masses the crucible containing a sample of CuSO<sub>4</sub>•5H<sub>2</sub>O(s). The student repeatedly heats and masses the crucible and its contents until the mass is constant. The student's recorded experimental data and calculations are shown below.

Data and calculation before heating:

mass of CuSO <sub>4</sub> •5H <sub>2</sub> O(s) and crucible	21.37 g
– mass of crucible	19.24 g
mass of CuSO <sub>4</sub> •5H <sub>2</sub> O(s)	2.13 g

Data and calculation after heating to a constant mass:

mass of CuSO <sub>4</sub> (s) and crucible	20.61 g
– mass of crucible	19.24 g
mass of CuSO <sub>4</sub> (s)	1.37 g

Calculation to determine the mass of water:

mass of CuSO <sub>4</sub> •5H <sub>2</sub> O(s)	2.13 g
– mass of CuSO <sub>4</sub> (s)	1.37 g
mass of H <sub>2</sub> O(g)	0.76 g

**Refer to Figure 3 and answer the following Question:**

Using the student's data, what is the correct numerical setup for calculating the percent composition by mass of water in the hydrate?

- A  $\% \text{H}_2\text{O} = \frac{2.13 \text{ g}}{0.76 \text{ g}} \times 100$
- B  $\% \text{H}_2\text{O} = \frac{2.13 \text{ g}}{21.37 \text{ g}} \times 100$
- C  $\% \text{H}_2\text{O} = \frac{0.76 \text{ g}}{1.37 \text{ g}} \times 100$
- D  $\% \text{H}_2\text{O} = \frac{0.76 \text{ g}}{2.13 \text{ g}} \times 100$

**42 Answer \_\_\_\_\_**

The gram-formula mass of (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> is

- A 46.0 g
- B 64.0 g
- C 78.0 g
- D 96.0 g

**43 Answer \_\_\_\_\_**

One mole of which substance contains a total of  $6.02 \times 10^{23}$  atoms?

- A Li
- B NH<sub>3</sub>
- C O<sub>2</sub>
- D CO<sub>2</sub>

**44 Answer \_\_\_\_\_**

What is the chemical formula for sodium sulfate?

- A Na<sub>2</sub>SO<sub>4</sub>
- B Na<sub>2</sub>SO<sub>3</sub>
- C NaSO<sub>4</sub>
- D NaSO<sub>3</sub>

**45 Answer \_\_\_\_\_**

A molecule must be nonpolar if the molecule

- A is linear
- B is neutral
- C has ionic and covalent bonding
- D has a symmetrical charge distribution

**46 Answer \_\_\_\_\_**

Which property is used to determine the degree of polarity between two bonded atoms?

- A density
- B electronegativity
- C pressure
- D temperature

**47 Answer \_\_\_\_\_**

Which term represents an intermolecular force in a sample of water?

- A hydrogen bonding
- B covalent bonding
- C metallic bonding
- D ionic bonding

**48 Answer \_\_\_\_\_**

Which compound contains both ionic and covalent bonds?

- A KI
- B CaCl<sub>2</sub>
- C CH<sub>2</sub>Br<sub>2</sub>
- D NaCN

**49 Answer \_\_\_\_\_**

Element X reacts with copper to form the compounds CuX and CuX<sub>2</sub>. In which group on the Periodic Table is element X found?

- A Group 1
- B Group 2
- C Group 13
- D Group 17

**50 Answer \_\_\_\_\_**

Which compound has the strongest hydrogen bonding at STP?

- A H<sub>2</sub>O
- B H<sub>2</sub>S
- C H<sub>2</sub>Se
- D H<sub>2</sub>Te

**51 Answer \_\_\_\_\_**

Which atom has the greatest attraction for the electrons in a chemical bond?

- A hydrogen
- B oxygen
- C silicon
- D sulfur

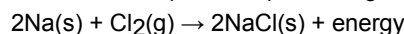
**52 Answer \_\_\_\_\_**

Which formula represents a polar molecule?

- A O<sub>2</sub>
- B CO<sub>2</sub>
- C NH<sub>3</sub>
- D CH<sub>4</sub>

**53 Answer \_\_\_\_\_**

Given the balanced equation representing a reaction:



If 46 grams of Na and 71 grams of Cl<sub>2</sub> react completely, what is the total mass of NaCl produced?

- A 58.5 g
- B 117 g
- C 163 g
- D 234 g

**54 Answer \_\_\_\_\_**

In which type of reaction can two compounds exchange ions to form two different compounds?

- A synthesis
- B decomposition
- C single replacement
- D double replacement

**55 Answer** \_\_\_\_\_

What is the number of pairs of electrons that are shared between the nitrogen atoms in a molecule of  $N_2$ ?

- A 1
- B 2
- C 3
- D 6

**56 Answer** \_\_\_\_\_

Which atoms will bond when valence electrons are transferred from one atom to the other?

- A O and Se
- B O and Sr
- C O and H
- D O and P

**57 Answer** \_\_\_\_\_

What is the chemical formula of iron(III) sulfide?

- A FeS
- B  $Fe_2S_3$
- C  $FeSO_3$
- D  $Fe_2(SO_3)_3$

**58 Answer** \_\_\_\_\_

Which element, represented by X, reacts with fluorine to produce the compound  $XF_2$ ?

- A aluminum
- B argon
- C magnesium
- D sodium

**59 Answer** \_\_\_\_\_

A compound is made up of iron and oxygen, only. The ratio of iron ions to oxide ions is 2:3 in this compound. The IUPAC name for this compound is

- A triiron dioxide
- B iron (II) oxide
- C iron (III) oxide
- D iron trioxide

**60 Answer** \_\_\_\_\_

What is the correct Lewis electron-dot structure for the compound magnesium fluoride?

- A  $Mg : \overset{\cdot\cdot}{\underset{\cdot\cdot}{F}} : \overset{\cdot\cdot}{\underset{\cdot\cdot}{F}} :$       C  $[\overset{\cdot\cdot}{\underset{\cdot\cdot}{F}}]^- Mg^{2+} :$
- B  $Mg^+ [\overset{\cdot\cdot}{\underset{\cdot\cdot}{F}}]^-$       D  $:\overset{\cdot\cdot}{F} : \overset{\cdot\cdot}{Mg} : \overset{\cdot\cdot}{I}$

**61 Answer** \_\_\_\_\_

Which type of substance can conduct electricity in the liquid phase but *not* in the solid phase?

- A ionic compound
- B molecular compound
- C metallic element
- D nonmetallic element

**62 Answer** \_\_\_\_\_

Which formulas represent two polar molecules?

- A  $CO_2$  and HCl
- B  $CO_2$  and  $CH_4$
- C  $H_2O$  and HCl
- D  $H_2O$  and  $CH_4$

**63 Answer** \_\_\_\_\_

Based on bond type, which compound has the highest melting point?

- A  $CH_3OH$
- B  $C_6H_{14}$
- C  $CaCl_2$
- D  $CCl_4$

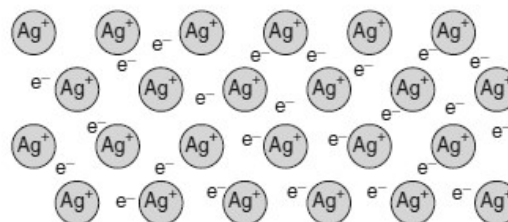
**64 Answer** \_\_\_\_\_

Which formula represents a nonpolar molecule containing polar covalent bonds?

- A  $H_2O$
- B  $CCl_4$
- C  $NH_3$
- D  $H_2$

**65 Answer** \_\_\_\_\_

The particle diagram below represents a solid sample of silver.



Which type of bonding is present when valence electrons move within the sample?

- A metallic bonding
- B hydrogen bonding
- C covalent bonding
- D ionic bonding