Assessment

Chemistry: Lesson 08

Question 1

Which of these is an “empirical formula”?

A.C_2H_6

B.H_2O_2

C.NO_2

D.N_2O_4

Question 2

The empirical formula for C6H24 is _____.

A.C2H12

B.CH18

C.C3H12

D.CH4

Question 3

Molecular shapes are shown with _____ formulas.

A.structural

B.molecular

C.empirical

D.chemical

Question 4

All of the following elements are diatomic except _____.

A.Hydrogen

B.Nitrogen

C.Sulfur

D.Chlorine

Question 5

Four of the diatomic elements are in the family known as the _____.

A.Alkali metals

B.Alkaline earth metals

C.Chalcogens

D.Halogens

Question 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

Question 7

A single covalent bond equals _____ shared electrons.

A.1

B.2

C.3

D.4

Question 8

Sodium (Na) forms covalent bonds.

A.True

B.False

Question 9

Elements and compounds are classified as:

A.mixtures

B.ionic substances

C.pure substances

D.molecular substances

Question 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

Assessment

Chemistry: Lesson 09

Question 1

Calcium and oxygen in a compound should have the formula:

A.Ca2O

B.CaO

C.CaO2

D.Ca2O2

Question 2

Carbon tetrafluoride should have the formula _____.

A.CF4

B.CF

C.C4F

D.CF2

Question 3

Aluminum with nitrogen is a compound with the formula _____.

A.Al3N3

B.Al3N

C.AlN3

D.AlN

Question 4

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

Question 5

Na2O is the formula for which compound?

A.sodium oxide

B.sodiu (I) oxide

C.sodium(II) oxide

D.sodium oxate

Question 6

The correct name for the acid HI is _____ acid.

A.hydrogen iodate

B.Hydroiodic

C.hydrogen iodite

D.hydrogen iodide

Question 7

The compound H2S is named “sulfuric acid”.

A.True

B.False (Hydrosulfuric **Acid)**

Question 8

SO42- is a polyatomic ion.

A. True

B. False

Question 9

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

Question 10

Which of the following is a polyatomic ion?

A.S^{2-}

B.O_2

C.OH^-

D.Al^{3+}

Assessment

Chemistry: Lesson 10

Question 1

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

A.True

B.False

Question 2

Potassium's atomic number is 19 and its atomic weight is 39.1, so its molar mass is ____.

A. 19

B. 20.1

C. 39.1

D. 78.2

Question 3

Element X as a molar mass of 30, and element Y has a molar mass of 50. Which has the greater number of moles?

A. 30 g of X

B. 50 g of X

C. 30 g of Y

D. 50 g of Y

Question 4

160 g or an element with a molar mass of 40 = _____ moles?

A. 0.25

B. 4

C.120

D.200

Question 5

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

A. True

B. False

Question 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

Question 7

Which of the following would have the higher 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

Question 8

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

A.2.007 x 1023

B.1.8066 x 1023

C.2.007 x 1024

D.1.8066 x 1024

Question 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

Question 10

How many atoms of hydrogen are in a molecule of (NH4)2CO3?

A.2

B.4

C.6

D.8

Question 11

Avogadro's number is _____.

A.2.066 ×1023

B.6.022 ×1023

C.6.025 ×1024

D.6.023 ×1022

Question 12

In 4.5 moles of K2S, there are _____ moles of K ions.

A.9.0

B.4.5

C.13.5

D.18.0

Assessment

Chemistry: Lesson 11

Question 1

The formula $Ca(NO_3)_2$ has a molar mass of _____ g/mol.

A.70.1

B.102.1

C.116.1

D.164.1

Question 2

The formula $3(NH_4)_2CO_3$ has a total of _____ hydrogens.

A.8

B.24

C.16

D.22

Question 3

For C_3H_7COOH, with a molar mass of 88.0 g/mol, carbon's percentage composition is _____

A.40.9%

B.54.5%

C.62.5%

D.95.5%

Question 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%

Question 5

Which compound has the highest percentage composition of carbon?

A. CH_4

B. C_3H_8

C. $C_3H_6O_2$

D. $C_4H_8O_2$

Question 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

Question 7

C_2H_4 and C_3H_6 have the same empirical formula.

A.True

B.False

Question 8

The empirical formula for C_4H_{10} is CH_5.

A.True

B.False

Question 9

If a compound has an empirical formula of CH_20 and a molar mass of 150 g/mol, its molecular formula is $C_5H_{10}O_5$.

A.True

B.False

Question 10

The letters "s", "l", "g", and "aq" are used to indicate the states of substances in the chemical equations.

A.True

B.False

Question 11

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

A.1

B.2

C.3

D.4

Assessment

Chemistry:
Lesson13

Question 1

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
the molar masses: $C_3H_8 = 44.0$, $O_2 = 32.0$, $CO_2 = 44.0$, $H_2O = 18.0$
10 mol O_2 with an excess of C_3H_8 should produce _____ mol CO_2.

A.3

B.4

C.5

D.6

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
the molar masses: $C_3H_8 = 44.0$, $O_2 = 32.0$, $CO_2 = 44.0$, $H_2O = 18.0$
10 mol O_2 with an excess of C_3H_8 should produce _____ mol CO_2.

- $C_3H_8 + \quad 5O_2 \rightarrow \quad 3CO_2 \quad + \quad 4H_2O$
  10 mole ? Mole

- Soln:
- Step 1: no need "the numbers are in moles"
- Step 2: $5O_2 \rightarrow 3CO_2$ (from equation)
  $10\ O_2 \rightarrow XCO_2$

  X= 6 moles CO_2

  Step 3: No need (the answer is in moles)

Question 2

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
the molar masses: $C_3H_8 = 44.0$, $O_2 = 32.0$, $CO_2 = 44.0$, $H_2O = 18.0$
44.0 g C_3H_8 with an excess of O_2 yields _____ g CO_2.

A.44.0

B.88.0

C.132

D.176

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
the molar masses: $C_3H_8 = 44.0$, $O_2 = 32.0$, $CO_2 = 44.0$, $H_2O = 18.0$
44.0 g C_3H_8 with an excess of O_2 yields _____ g CO_2.

- $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
  44 g ? G
- Soln:
- Step 1: Convert grams to moles
- 44g C_3H_8/44g/mole ===== 1 mole C_3H_8

- Step 2: $1C_3H_8 \rightarrow 3CO_2$ (from equation)
  $1\ C_3H_8 \rightarrow XCO_2$

  X= 3 moles CO_2

Step 3: convert moles to grams CO_2

3 moles CO_2 * 44g CO_2/mole ====== 132 g

Question 3

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
the molar masses: $C_3H_8 = 44.0$, $O_2 = 32.0$, $CO_2 = 44.0$, $H_2O = 18.0$
A yield of 66 g CO_2 should also yield _____ g H_2O.
A.18

B.36

C.54

D.72

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
the molar masses: $C_3H_8 = 44.0$, $O_2 = 32.0$, $CO_2 = 44.0$, $H_2O = 18.0$
A yield of 66 g CO_2 should also yield _____ g H_2O.

- $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
- 66g ?g
- Soln:
- Step 1: Convert grams to moles
- 66g CO_2/44g/mole ===== 1.5 mole CO_2

- Step 2: $3CO_2 \rightarrow 4H_2O$ (from equation)
  $1.5\ CO_2 \rightarrow XH_2O$

  X= 2 moles H_2O

Step 3: convert moles to grams H_2O

2 moles H_2O * 18g H_2O/mole ====== 36 g

Question 4

$4Al + 3O2 \rightarrow 2Al2O3$

the molar masses: Al = 27.0, O2 = 32.0, Al2O3 = 102.0

108 g Al needs _____ g O2 without either one being a limiting reactant.

A.96.0

B.102.0

C.108.0

D.114.0

4Al + 3O2 → 2Al2O3
the molar masses: Al = 27.0, O2 = 32.0, Al2O3 = 102.0
108 g Al needs _____ g O2 without either one being a limiting reactant.

- 4Al + 3O2 → 2Al2O3

  108g ?g
- Soln:
- Step 1: Convert grams to moles
- 108g Al/27g/mole ===== 4mole Al

- Step 2: 4Al → 3O2 (from equation)

  4Al → XO2

  X= 3 moles O2

Step 3: convert moles to grams O2

3moles O2 * 32g O2/mole ====== 96 g O2

Question 5

$4Al + 3O_2 \rightarrow 2Al_2O_3$
the molar masses: Al = 27.0, O_2 = 32.0, Al_2O_3 = 102.0
54.0 g Al with an excess of O_2 yields _____ g Al_2O_3.

A.102.0

B.204.0

C.76.5

D.51.0

4Al + 3O2 → 2Al2O3
the molar masses: Al = 27.0, O2 = 32.0, Al2O3 = 102.0
54.0 g Al with an excess of O2 yields ____ g Al2O3..

- 4Al + 3O2 → 2Al2O3

  54g ?g
- Soln:
- Step 1: Convert grams to moles
- 54g Al/27g/mole ===== 2mole Al

- Step 2: 4Al → 2Al2O3 (from equation)

  2Al → XAl2O3

  X= 1 moles Al2O3

Step 3: convert moles to grams Al2O3

1moles Al2O3 * 102g Al2O3/mole ====== 102g Al2O3

Question 6

$4Al + 3O_2 \rightarrow 2Al_2O_3$
the molar masses: Al = 27.0, O_2 = 32.0, Al_2O_3 = 102.0
To make 51.0 g Al_2O_3, we need _____ g Al.

A.108.0

B.51.0

C.27.0

D.20.0

4Al + 3O2 → 2Al2O3
the molar masses: Al = 27.0, O2 = 32.0, Al2O3 = 102.0
To make 51.0 g Al2O3, we need _____ g Al.

- 4Al + 3O2 → 2Al2O3

  ?g 51g
- Soln:
- Step 1: Convert grams to moles
- 51g Al2O3/102g/mole ===== 0.5 mole Al2O3

- Step 2: 4Al → 2Al2O3 (from equation)

  XAl → 0.5Al2O3

  X= 1 moles Al

Step 3: convert moles to grams Al

1moles Al * 27g Al/mole ====== 27g Al

Question 7

Stoichiometry is a comparison of quantities in reactions.

A. True

B. False

Question 8

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

If we started with 2 mol C_3H_8 and 8 mol O_2, C_3H_8 is the limiting reactant.

Soln
Step 1: No need The numbers are in moles
Step 2: convert moles reactants to mole products

C_3H_8 □ $3CO_2$
$2\ C_3H_8$ □ XCO_2
X = 6 moles CO_2

$5O_2 \rightarrow 3CO_2$
$8O_2 \rightarrow XCO_2$
X= 4.8 CO_2 less product means O_2 is the L.R

A.True

Question 9

Percent yield = (theoretical yield/actual yield) × 100.

A. True

B. False

Question 10

Mass of a reactant : mass of a product cannot be compared without changing the masses to moles.

A. True

B. False

Assessment

Chemistry: Lesson 12

Question 1

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

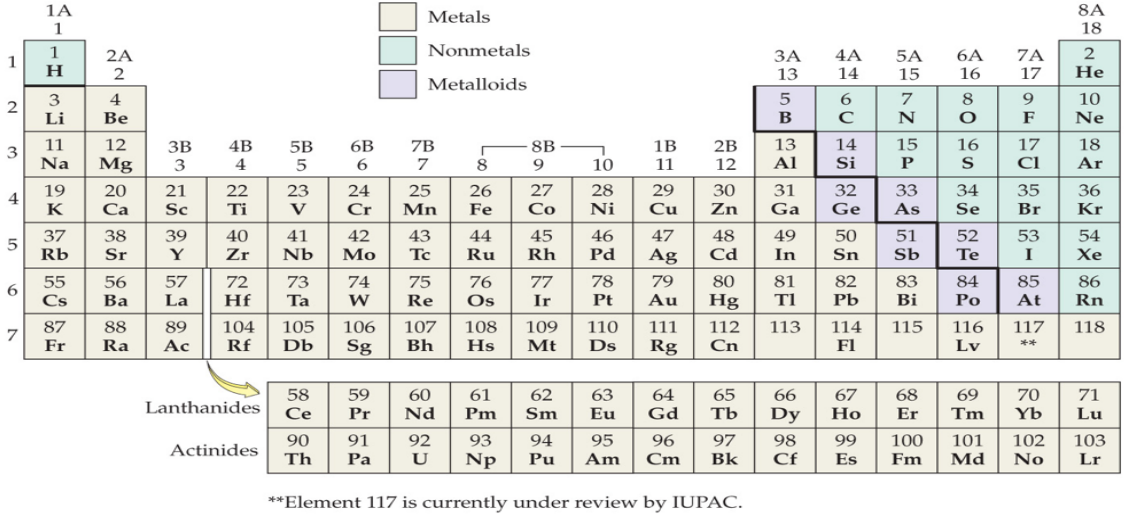
A) 2

B) 3

C) 1

D) 5

E) 0



Question 2

How many bonding pairs of electrons are in one molecule of water (H2O)?

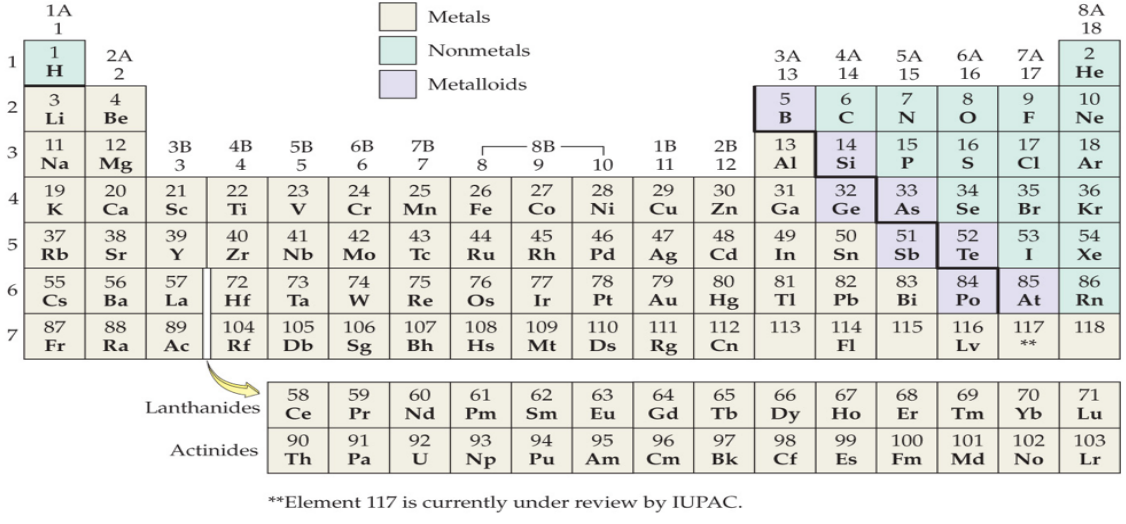
A) 0

B) 1

C) 2

D) 4

E) 6



Question 3

How many lone pairs are around the central atom in the ammonium ion?

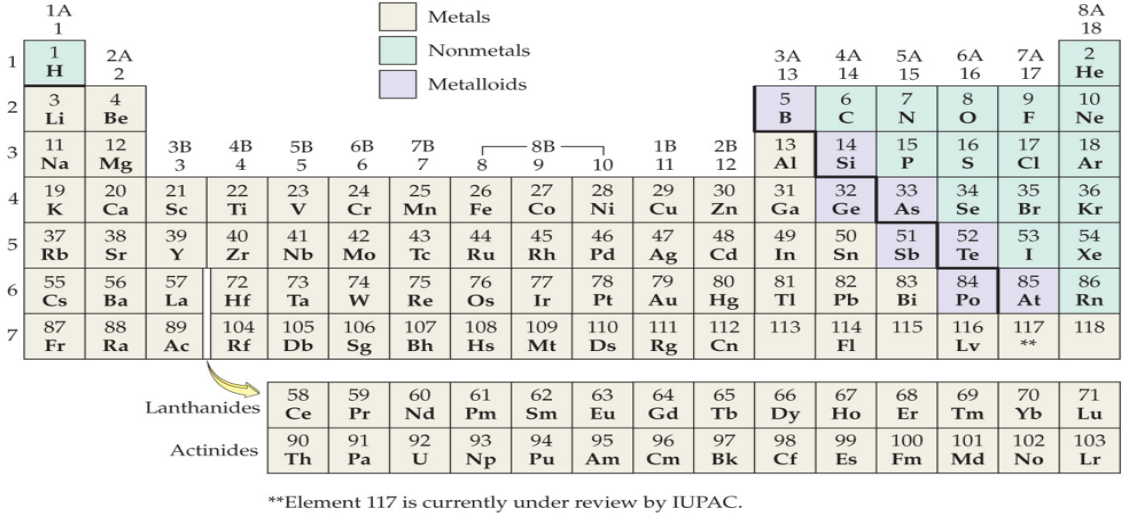
A) 1

B) 4

C) 0

D) 16

E) 12



Question 4

How many lone pairs of electrons are in sulfur atom in SO2?

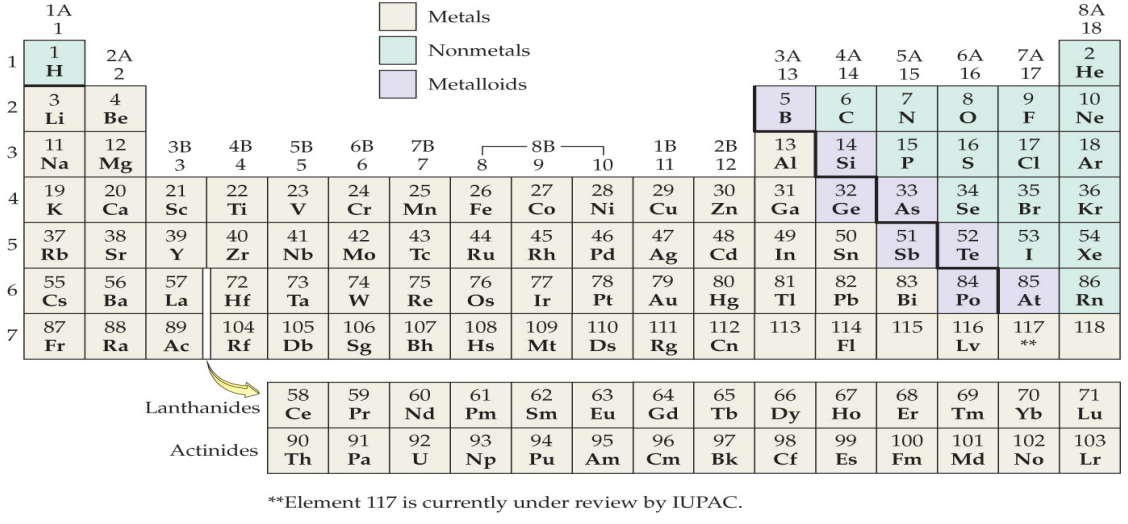
A) 2

B) 3

C) 1

D) 6

E) 0



Question 5

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

A. True

B.False

Question 6

The most electronegative element is fluorine.

A. True

B. False

Question 7

Which is the strongest bond?

A. C – H

B. C – C

C. C = C

D. C ≡ C

Question 8

Long bonds are usually _____.

A.Strong

B.Weak

C.Triple

D.Stable

Question 9

Which should be the shortest bond?

A.C – C

B.C ≡ C

C.O = O

D.C = C

Question 10

Triple bonds tend to be _____.

A.short and weak

B.long and weak

C.long and strong

D.short and strong