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 14

Question 1

What unit is molarity measured in?

A.g/L

B.mol/L

C.g/mol

D.L/mol

The molarity of a solution is defined as the number of

A. moles of solute per liter of solution.
B. moles of solute per kg of solution.
C. grams of solute per liter of solution.
D. moles of solute per kg of solvent.
E. grams of solvent per kg of solution.

Question 3

What is the molarity of a KNO_3 solution containing 2.45 mol KNO_3 in 500. mL of solution?

A. 0.049 M

B. 204 M

C. 2.45 M

D. 0.500 M

E. 4.90 M

Question 4

What is the molarity of 2.0 moles of glucose in 4.0 L of glucose solution?

A. 0.25 M glucose

B. 0.50 M glucose

C. 0.75 M glucose

D. 1.00 M glucose

Question 5

In aqueous solutions, water is the solute.

solvent

A.True

B.False

Question 6

The molar mass of NaCl is 58.50 g/mol so 29.25 g NaCl in 1 L of solution has a molarity of 0.5 M.

A.True

B.False

Question 7

1 L of a 12 M solution is diluted to 2 L so its molarity becomes 6 M.

A.True

B.False

Which of the following aqueous solutions will be a strong electrolyte?

A. strong base (KOH) in water

B. ammonia (NH_3) in water

C. ethanol (C_2H_5OH) in water

D. sugar ($C_{12}H_{22}O_{11}$) in water

Which of the following solutions can be classified as non-electrolyte?

A. Table salt (NaCl) in water

B. ammonia (NH_3) in water

C. Acetic acid (CH_3COOH) in water

D. sugar ($C_{12}H_{22}O_{11}$) in water

Which of the following aqueous solutions would conduct electricity?

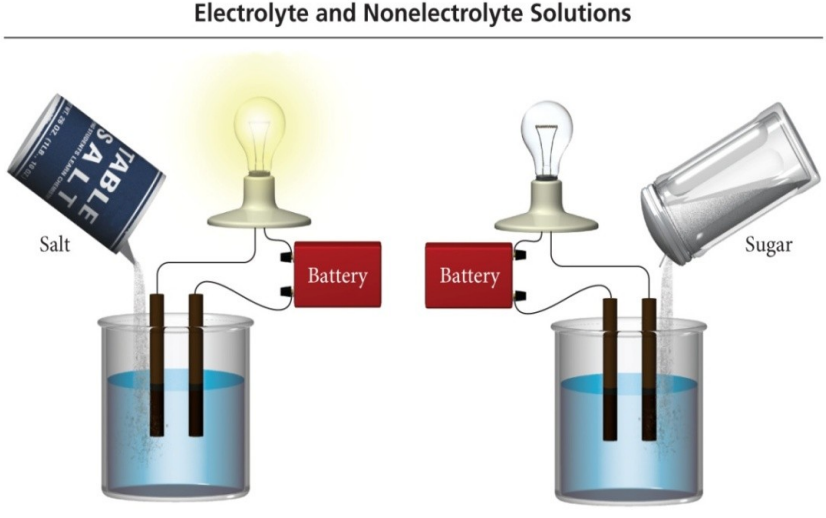
a) $AgNO_3$

b) $C_{12}H_{22}O_{11}$ (sucrose)

c) CH_3CH_2OH (ethanol)

d) all of the above

e) none of the above



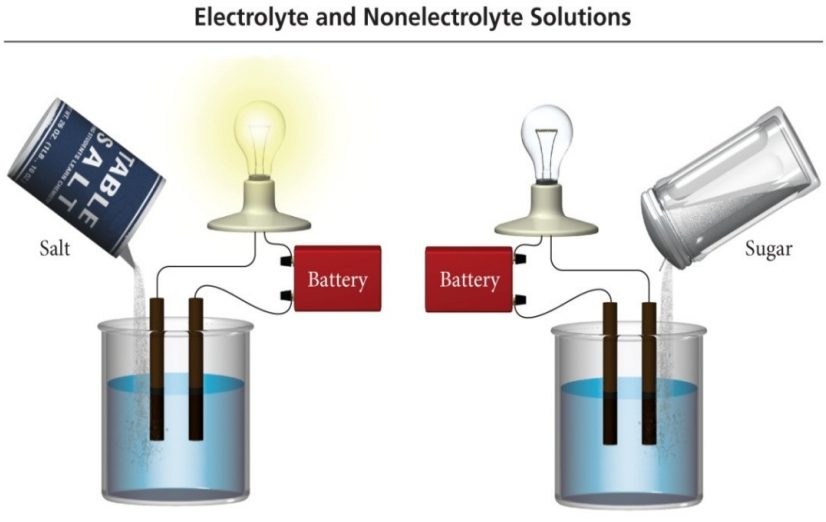
A substance dissolved in water that CANNOT conduct an electric current is called a(n)

A. electrical compound.

B. strong electrolyte.

C. weak electrolyte.

D. nonelectrolyte.



Assessment

Chemistry: Lesson 15

Neutralization reactions always produce:

A) Acids

B) Water

C) Bases

D) Salt

E) Both water and salt

The oxidation number of an element in the free or uncombined state is always

A. 0.
B. +1.
C. –1.
D. the same as its ionic charge.

Question 3

A substance is reduced if it

A. Lose electrons.
B. gains hydrogen atoms.
C. gains electrons.
D. None of these

Question 4

All of the following can have an oxidation number of +4 except

A. carbon.
B. calcium.
C. silicon.
D. lead.

Question 5

Oxidation is shown by which of these changes in oxidation states?

A) 0 to 2+

B) 5+ to 3+

C) 3+ to 0

D) 0 to 2-

Question 6

Which of the following shows an oxidation?

A) O_2 to O^{2-}

B) Cl_2 to Cl^{1-}

C) N^{3+} to N_2

D) H_2 to H^{1+}

Question 7

If one element is oxidized, another one is reduced.

A. True
B. False

Question 8

In $\overset{0}{N_2} + \overset{0}{O_2} \longrightarrow \overset{+4\ \ -2}{N_2O_4}$, nitrogen is reduced.

A. True

B. False