

Unit 1 Practice

Mass Measurements of a Platinum Cylinder

Balance	First measure (g)	Second Measure (g)	Third Measure (g)	Fourth Measure (g)
Q	24.94	25.26	25.29	24.51
R	25.50	24.50	25.00	24.49
S	24.99	24.99	25.20	24.92
T	24.99	25.03	24.98	25.02

1. The table shows four mass readings of one object as measured by four different balances. Which balance produced the most precise measurements?

- D**
- (A) Q highest 25.29 - lowest 24.51 = 0.78 difference
 (B) R highest 25.50 - lowest 24.49 = 1.01 difference
 (C) S highest 25.20 - lowest 24.92 = 0.28 difference
 (D) **T** highest 25.03 - lowest 24.98 = 0.05 difference

2. The reason for wafting or fanning a small amount of chemical vapors toward the nose as a means to detect odors in a test tube is to —

- C**
- (A) avoid experimental error from excessive loss of mass of reactants or products.
 (B) avoid splashing chemicals into the face of any person.
 (C) **protect the respiratory tract against potentially harmful vapors.**
 (D) determine the relative strength of the odor before smelling directly.

3. Choose the correct answer for the following problem.

$$3.56 \times 10^{-4} \text{ L} + 2.11 \times 10^{-3} \text{ L}$$

$$3.56 \text{ E-4} + 2.11 \text{ E-3}$$

(A) $2.47 \times 10^{-4} \text{ L}$

(B) $5.67 \times 10^{-4} \text{ L}$

(C) $3.77 \times 10^{-4} \text{ L}$

(D) $2.47 \times 10^{-3} \text{ L}$

Use the **EE** Key

4. Choose the correct answer for the following problem.

$$3.00 \text{ E}^8 / 5.0 \text{ E}^{-2}$$

$$3.00 \times 10^8 \text{ m}^3 / 5.0 \times 10^{-2} \text{ m}^2$$

(A) $6 \times 10^{10} \text{ m}$

(B) $6 \times 10^9 \text{ m}$

(C) $6 \times 10^6 \text{ m}$

(D) $6 \times 10^5 \text{ m}$

B

5. A piece of iron wire is placed on the pan of a triple beam balance. The riders are all zero except for the rider on the 0 -10 gram beam, which is shown.



I can see 5.5g.
I estimate one digit beyond what I can see. I think it is exactly 5.5g so I estimate 5.50 g

6.

What is the mass of the iron wire?

- (A) 0.455 g (B) 0.55 g
(C) 5.5 g (D) 5.50 g

7. Which measurement contains four significant figures?

- (A) 0.0002 L leading zeros (B) 0.002 L leading zeros
(C) 2020 L trailing zero no decimal (D) 2002 L sandwiched zeros

8. What is the correct set-up for the conversion of 950 g to kg?

- (A) $950 \text{ g} \times \frac{1000 \text{ g}}{1 \text{ kg}}$ dont cancel
(B) $950 \text{ g} \times \frac{1000 \text{ kg}}{1 \text{ g}}$ Kg bigger than g - so need 1000g not Kg
(C) $950 \text{ g} \times \frac{1 \text{ kg}}{1000 \text{ g}}$
(D) $950 \text{ g} \times \frac{1 \text{ g}}{1000 \text{ kg}}$ dont cancel

The following tables are used in the problem below.

Experimental Data	
Volume of water in graduated cylinder	38.7 mL
Volume of water + metal	44.3 mL
Mass of weighing paper	3.96 g
Mass of weighing paper + metal	48.20 g

Density, g/cm ³	
Vanadium	5.96
Zinc	7.14
Iron	7.86
Copper	8.92

9.

Based on the given data, what kind of metal was used in this experiment?

- (A) zinc (B) iron
(C) copper (D) vanadium

Volume: $44.3 \text{ mL} - 38.7 \text{ mL} = 5.60 \text{ mL}$
 mass: $48.20 \text{ g} - 3.96 \text{ g} = 44.24 \text{ g}$

$D = \frac{m}{V}$ $D = \frac{44.24 \text{ g}}{5.60 \text{ mL}} = 7.90 \text{ g/mL}$ closest to Iron

Unit 2 Practice

1. A sample of material, which has a definite volume but no definite shape

- (A) is a solid. *definite both* (B) is a liquid.
 (C) is a gas. *no definite either* (D) does not exist.

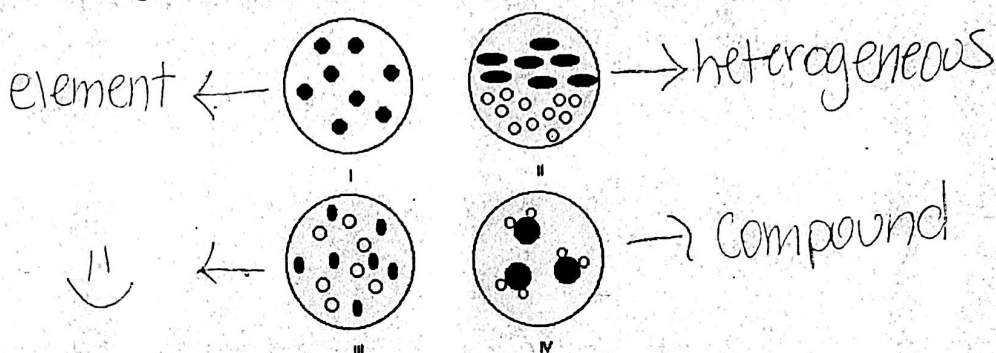
B

2. Which is a chemical change?

- (A) ~~evaporating alcohol~~ *State change* (B) burning butter *chemical product not butter*
 (C) ~~melting ice cubes~~ *State change* (D) forming fog *State change*

B

3. Which of the following microscopic representation shows a homogeneous mixture?



- (A) I (B) II (C) III (D) IV

C

4. Which state of matter describes a precipitate?

- (A) liquid (B) gas (C) plasma (D) solid (E) aqueous

precipitate = solid formed by reacting two solutions

D

5. Which of the following is an example of a chemical change?

- (A) ~~Ice cracking~~ *- still ice*
 (B) ~~Sugar dissolving~~ *- still sugar*
 (C) Milk souring *- A.T.*
 (D) ~~Lead melting~~ *- still lead*

C

6. Which property is *always* conserved during a chemical reaction?

- (A) mass (B) volume (C) pressure (D) solubility

*law of conservation of mass
 can't be created or destroyed, so it is
 "conserved" (stays the same).*

A

7. Which statement describes a chemical property of iron?

- (A) Iron can be flattened into sheets. - still iron
(B) Iron conducts electricity and heat. - still iron
(C) Iron combines with oxygen to form rust. - new substance
(D) Iron can be drawn into a wire. - still iron

8. Which of the following is NOT an intensive physical property for bromine

- (A) Bromine has a reddish brown color → not dependent on amount
(B) Bromine is a liquid at room temperature → doesn't change with amount
(C) Bromine has a density of 3.1 g/cm³ → fixed ratio
(D) Bromine has a volume of 5.00 L → depends on amount

9. The weather man has just confirmed that this holiday season 5250.00 g of snow will fall from the sky. If the mass of the oxygen gas in the sky is 787.90 g. What mass of hydrogen gas was in the sky? Remember that snow is solid water.

- (A) 6037.90 g
(B) 4462.10 g
(C) 6.6633 g
(D) 0.15007 g

This isn't the best question, but the law of conservation of mass applies.

$$\begin{array}{r} \text{Oxygen} + \text{hydrogen} \rightarrow \text{Water} \\ 787.90\text{g} \quad \times \quad = 5250.00\text{g} \\ 5250.00 - 787.90 = 4462.10\text{g} \end{array}$$

Unit 3 Practice

metalloid (typo)
 ↓ Corrected on Moodle

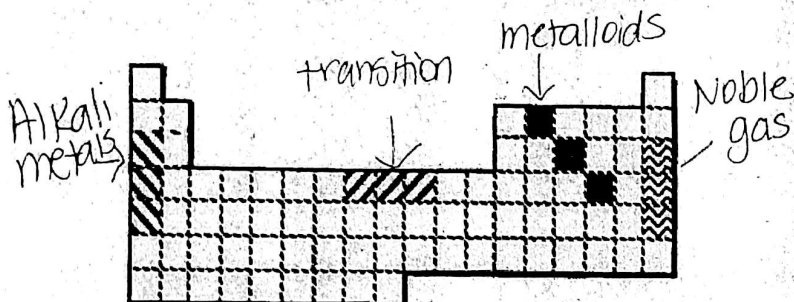
1. Which of the following elements cannot be classified as a nonmetal or metalloid?

B

- (A) Arsenic, As - metalloid
- (B) Sodium, Na - metal
- (C) Boron, B - metalloid
- (D) Bromine, Br - non-metal
- (E) Oxygen, O - non-metal

2. Which set of elements contains transition elements?

A



- (A) Elements 26, 27, 28
- (B) Elements 18, 36, 54
- (C) Elements 11, 19, 37
- (D) Elements 6, 15, 34

3. An isotope differs from other isotopes of the same element,

E

- (A) only by number of electrons
- (B) only by number of protons.
- (C) by atomic number.
- (D) only by mass number.
- (E) by mass number and number of neutrons.

isotope - same element but different numbers of neutrons (thus leading to different masses)

4. If atoms of a metallic element (such as sodium) react with atoms of a nonmetallic element (such as sulfur), which element loses electrons and which element gains them?

C

- (A) metallic element gains and non-metallic element loses electrons
- (B) both gain electrons
- (C) metallic element loses and non-metallic element gains electrons
- (D) both lose electrons

metals = cations = lose e⁻ nonmetals = anions = gain e⁻

5. On the periodic table, where are the nonmetals located?

A

- (A) upper right
- (B) lower right
- (C) upper-left
- (D) lower left

Right of the zig-zag line

The hypothetical element X has two isotopes.

$$\frac{(39.997)(30.1) + (44.995)(69.9)}{100}$$

Isotope	Isotopic Mass (amu)	Percentage of Naturally Occurring Isotope
^{40}X	39.997	30.1%
^{45}X	44.995	69.9%

3

6. What is the average atomic mass of element X?
- (A) 45.0 amu (B) 43.5 amu
 (C) 42.5 amu (D) 40.0 amu

D

7. The ion of potassium-42, $^{42}_{19}\text{K}^+$, contains
- (A) 18 protons, 19 electrons, and 24 neutrons.
 (B) 19 protons, 18 electrons, and 22 neutrons.
 (C) 19 protons, 19 electrons, and 23 neutrons.
 (D) 19 protons, 18 electrons, and 23 neutrons.

mass ← 42 K + ← ion (loses e⁻) = 18
 # ← 19 K 42 (p+n)
 -19 (p⁺)
 23 n⁰
 mass = p+n

B

8. What is the composition of one atom of bromine-80?
- (A) 45 protons, 35 neutrons, 45 electrons
 (B) 35 protons, 45 neutrons, 35 electrons
 (C) 35 protons, 45 neutrons, 80 electrons
 (D) 80 protons, 80 neutrons, 35 electrons

mass ↓
 80
 -35
 45
 look on periodic table for mass
 35

C

9. How many neutrons are present in an ion of $^{75}_{33}\text{As}^{3-}$?
- (A) 108 (B) 75 (C) 42 (D) 33

75 - 33 = 42

C

10. The quantum mechanical model of the atom
- (A) Defines the exact path of an electron around the nucleus
 (B) Was proposed by Niels Bohr.
 (C) Is concerned with the probability of finding an electron in a certain position.
 (D) Has many analogies in the visible world.

Unit 4 Practice

1. One of the emission lines associated with the hydrogen atom has a frequency of 3.23×10^{15} Hz. What is the energy associated with a photon of this frequency?

A

(A) 2.14×10^{-18} J
 (B) 2.14×10^{-19} J
 (C) 6.25×10^{-32} J
 (D) 1.86×10^{-32} J

$E = h\nu$ $h = 6.626 \times 10^{-34}$ (Planck's constant)
 $E = (6.626 \times 10^{-34}) (3.23 \times 10^{15})$

2. A popular radio station broadcasts with a frequency of 9.87×10^7 Hz. What is the wavelength (in meters) of the broadcast?

*
typo:
no correct
answer

(A) 2.96×10^{16} m
 (B) 3.04×10^6 m
 (C) 2.96×10^{10} m
 (D) 6.54×10^{-26} m

$c = 3.0 \times 10^8$ m/s (speed of light)
 $\lambda = \text{wavelength}$
 $\nu = \text{frequency}$
 $c = \lambda \nu$
 $3.0 \times 10^8 \text{ m/s} = \lambda (9.87 \times 10^7 \text{ Hz})$
 $\lambda = \frac{3.0 \times 10^8 \text{ m/s}}{9.87 \times 10^7 \text{ Hz}} = \frac{3.0 \times 10^8}{9.87 \times 10^7} \text{ m}$
 $= 3.04 \text{ m}$ → typo: not a choice

* Corrected on Moodle → **B** is the right answer

3. Which atom contains a partially filled 3p orbital?

D

(A) iron (B) calcium (C) argon (D) aluminum (E) boron

$3d^6$ $4s^2$ $3p^6$ full $3p^1$ $2p^1$

4. What is the maximum number of electrons allowed in an orbital?

B

(A) 1 (B) 2 (C) 3 (D) 6 (E) 10

5. Which element has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10}$?

A

(A) zinc (B) chromium (C) copper (D) manganese

6. What is the electron dot diagram for the nitrogen atom? $N = \text{group } 15 = 5 \text{ valence } e^-$

C

(A) N: (B) \dot{N} : (C) $\cdot\dot{N}$: (D) $:\dot{N}$:

7. Which is the electronic configuration for the scandium atom, Mn?

D

(A) $[\text{Ne}]3s^2 3p^3$
 (B) $[\text{Ar}]4s^2$
 (C) $[\text{Kr}]$
 (D) $[\text{Ar}]4s^2 3d^5$

manganese (typo) → Corrected on Moodle
 element 25 → $3d^5$

8. An atom has atomic number 13 and mass number 27. The number of valence electrons is $13 - 10 = 3$ valence $1s^2 2s^2 2p^6 3s^2 3p^1$
 $2+1=3$

B

- (A) 2 (B) 3 (C) 4 (D) 5 (E) 13

9. Which group represents particles with the same number of electrons?

C

- (A) $9, 10, 11$ F, Ne, Na
 (B) $10, 13, 10$ Mg^{+2}, Al, Si^{+4}
 (C) $18, 18, 18$ Cl, Ar, K^+
 (D) $10, 18, 36$ O^{2-}, S^{2-}, Se^{2-}
 (E) $18, 24, 50$ $Ca^{+2}, Fe^{+2}, Cd^{+2}$

10. What is the electron configuration for the sodium ion?

B

- (A) $1s^2 1p^6 2s^2 2p^6$
 (B) $1s^2 2s^2 2p^6 \rightarrow$ ion (lose e^-)
 (C) $1s^2 2s^2 2p^6 3s^2 \rightarrow Mg$
 (D) $1s^2 2s^2 2p^6 3s^1 \rightarrow$ sodium atom

Atomic Radii (nm)

H					
0.030					
Li	Be	B	C	N	O
0.128	0.089	0.080	0.077	0.070	0.066
Na	Mg	Al	Si	P	S
0.157	0.136	0.125	0.117	0.110	0.104
K	Ca	Ga	Ge	As	Se
0.203	0.174	0.125	0.122	0.121	0.117

11.

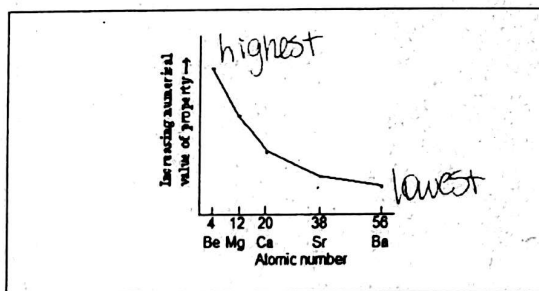
The table shows the atomic radii of some elements in Periods 1 through 4 of the periodic table. Which inference can be made from this information?

D

- (A) Atomic radii double from top to bottom.
 (B) Atomic radii increase from bottom to top.
 (C) Atomic radii decrease from right to left.
 (D) Atomic radii decrease from left to right.

12. Consider a plot of a property of the alkaline earth metals.

grp 2
 Be
 Mg
 Ca
 Sr
 Ba



Which property is plotted on this graph?

- (A) ionization energy decreases down
 (B) atomic radius increases
 (C) atomic mass increases
 (D) number of valence electrons all 2

decreasing down the group

Unit 5 Practice

1. Elements **Q** and **T** are on opposite sides of the periodic chart. This indicates that in the compound **QT**

D

- (A) **Q** and **T** are widely separated in atomic number.
- (B) there is a polyatomic ion present.
- (C) the bond is principally molecular (covalent) in character.
- (D) the bond is principally ionic in character

+ -
left side right side

2. In an ionic compound that the "goal" (or end result) is for the compound to have a _____ charge.

C

- (A) positive
- (B) negative
- (C) neutral
- (D) large
- (E) small

3. The correct formula for iron (III) sulfate is



B

- (A) $FeSO_4$
- (B) $Fe_2(SO_4)_3$
- (C) $Fe(SO_4)_2$
- (D) $Fe_3(SO_4)_2$
- (E) Fe_2SO_4

4. Which formula represents the compound diphosphorus pentasulfide?

D

- (A) P_2S
- (B) PS_2
- (C) P_4S
- (D) P_2S_5

$\frac{2}{P}$ $\frac{5}{S}$

5. Which formula is followed by its correct name?

A

- (A) $FeCl_3$, iron(III) chloride
- (B) FeS , iron(II) sulfite → iron(II) sulfide
- (C) Mg_3N_2 , magnesium nitrite → magnesium nitride
- (D) KNO_2 , potassium nitrate → potassium nitrite

Yb has to have +3 } NO₃⁻ had 3 for total -3

6. The formula for ytterbium nitrate is Yb(NO₃)₃. What is the formula for ytterbium chloride?

D

(A) YbCl₂

(B) Yb₂Cl₃

(C) Yb₂Cl₂

(D) YbCl₃

Yb⁺³ Cl⁻

7. What is the formula for copper (II) chloride?

B

(A) CuCl

(B) CuCl₂

(C) Cu₂Cl₂

(D) Cu₃Cl₂

(E) Cu₂Cl



8. What is the name of (NH₄)₂SO₄?

B

(A) ammonia sulfite

(B) ammonium sulfate

(C) ammonium sulfite

(D) ammonia sulfate

(E) diammonia sulfur tetroxide

9. What type of bond exists in calcium oxide, CaO?

B

(A) covalent

(B) ionic

(C) hydrogen

(D) metallic

metal + nonmetal

10. What is the formula for diarsenic trioxide?

C

(A) As₂(O₂)₃

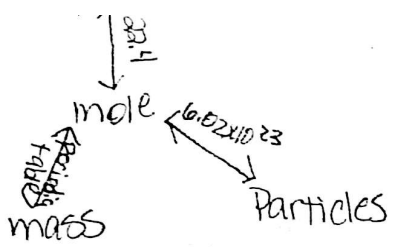
2

3

(B) As₃(O₂)₂

(C) As₂O₃

(D) As₃O₂



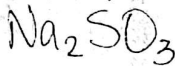
Unit 6 Practice

N: $1 \times 14 = 14$
 H: $5 \times 1 = 5$
 O: $1 \times 16 = 16$
 } total 35 $\frac{5}{35} \times 100$

1. The percentage of hydrogen in NH_4OH is
 (A) 5.00% (B) 35.0% (C) 14.3% (D) 11.4% (E) 25.7%

2. What is the smallest representative unit for Al_2O_3 ? *metal + nonmetal = ionic*
ionic = formula units
 (A) atoms (B) molecules
 (C) formula units (D) moles

3. A compound consists of 36.5% sodium, 25.4% sulfur and 38.0% oxygen. What is its empirical formula?



(A) Na_2SO_4 (B) NaS_2O_4 (C) Na_2SO_3 (D) $\text{Na}_2(\text{SO}_4)_2$
 $\frac{36.5 \text{ g Na}}{23 \text{ g Na}} \times 1 \text{ mol Na} = 1.59$ $\frac{25.4 \text{ g S}}{32 \text{ g S}} \times 1 \text{ mol S} = 0.79$ $\frac{38.0 \text{ g O}}{16 \text{ g O}} \times 1 \text{ mol O} = 2.38$
 $\frac{1.59}{0.79} = 2$ $\frac{0.79}{0.79} = 1$ $\frac{2.38}{0.79} = 3$

4. How many atoms are in one molecule of acetone, CH_3COCH_3 ?

- (A) 1 (B) 6 (C) 3 (D) 10

C-3
 H-6
 O-1

5. Which is an empirical formula?

- (A) N_2O_4 (B) P_4O_{10} (C) Hg_{21}I (D) Al_2O_3
 NO_2 P_2O_5 HgI

6. What is the molecular formula for a compound whose empirical formula is CH_4O and molar mass is 96.0 g/mole.

- (A) $\text{C}_4\text{H}_{16}\text{O}_4$
 (C) $\text{C}_2\text{H}_8\text{O}_2$

- (B) $\text{C}_3\text{H}_{12}\text{O}_3$
 (D) CH_4O

$[C=12 + H=4 + O=16] = 32$ $(\text{CH}_4\text{O})_3$
 $\frac{96}{32} = 3 = \text{C}_3\text{H}_{12}\text{O}_3$

7. What is the number of molecules in 4.4 g of carbon dioxide?

- (A) 1.0×10^{22} (B) 6.0×10^{22} (C) 6.0×10^{23} (D) 6.0×10^{24}

$\frac{4.4 \text{ g CO}_2}{44 \text{ g CO}_2} \times 1 \text{ mol CO}_2 \times 6.02 \times 10^{23} \text{ molecules CO}_2 =$

8. What is the approximate molar mass of ammonium thiosulfate, $(\text{NH}_4)_2\text{S}_2\text{O}_3$?

- (A) 148 g/mole
 (C) 102 g/mole

- (B) 134 g/mole
 (D) 61 g/mole

N: $2 \times 14 = 28$
 H: $8 \times 1 = 8$
 S: $2 \times 32 = 64$
 O: $3 \times 16 = 48$
 148 g

9. At STP, what is the mass of 5.00 L of nitrogen gas, $N_2(g)$?

A

- (A) 6.25 g
(C) 1.25 g

- (B) 3.13 g
(D) 0.625 g

5.00 L N_2	1 mol N_2	28 g N_2
	22.4 L N_2	1 mol N_2

10. Which expression gives the number of moles in 175 g sucrose?

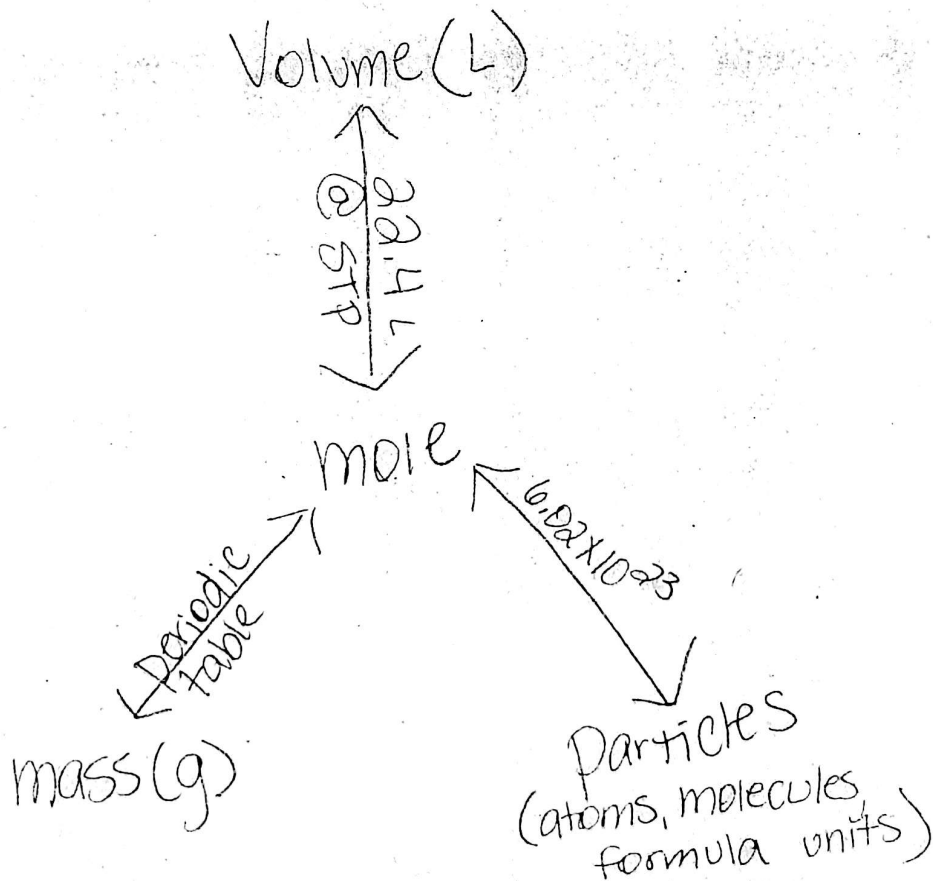
A

(A) $175 \text{ g } C_{12}H_{22}O_{11} \times \frac{1 \text{ mole } C_{12}H_{22}O_{11}}{342 \text{ g } C_{12}H_{22}O_{11}}$

(B) $175 \text{ g } C_{12}H_{22}O_{11} \times \frac{342 \text{ g } C_{12}H_{22}O_{11}}{1 \text{ mole } C_{12}H_{22}O_{11}}$ Don't cancel

(C) $175 \text{ g } C_{12}H_{22}O_{11} \times \frac{342 \text{ g } C_{12}H_{22}O_{11}}{1 \text{ mole } C_{12}H_{22}O_{11}} \times \frac{6.02 \times 10^{23} \text{ molecules } C_{12}H_{22}O_{11}}{1 \text{ mole } C_{12}H_{22}O_{11}}$ Don't cancel

(D) $175 \text{ g } C_{12}H_{22}O_{11} \times \frac{1 \text{ mole } C_{12}H_{22}O_{11}}{342 \text{ g } C_{12}H_{22}O_{11}} \times \frac{6.02 \times 10^{23} \text{ molecules } C_{12}H_{22}O_{11}}{1 \text{ mole } C_{12}H_{22}O_{11}}$ Don't need molecules

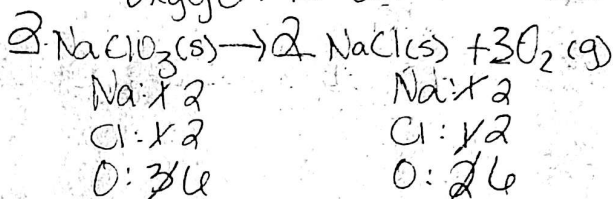


Unit 7 Practice

1. What is the correct equation for the following scenario: "Solid sodium chlorate decomposes into solid sodium chloride and oxygen gas."

$\text{Na}^+ \text{ClO}_3^-$
 Sodium chlorate
 $\text{NaClO}_3 (\text{s})$
 $\text{Na}^+ \text{Cl}^-$
 Sodium chloride: $\text{NaCl} (\text{s})$
 Oxygen is diatomic: O_2

- (A) $2 \text{NaClO}_3 (\text{s}) \rightarrow 2 \text{NaClO}_2 (\text{s}) + \text{O}_2 (\text{g})$
 (B) $\text{NaClO}_3 (\text{s}) \rightarrow \text{NaClO}_2 (\text{s}) + \text{O} (\text{g})$
 (C) $2 \text{NaClO}_3 (\text{s}) \rightarrow 2 \text{NaCl} (\text{s}) + 3 \text{O}_2 (\text{g})$
 (D) $2 \text{NaClO}_2 (\text{s}) + \text{O}_2 (\text{g}) \rightarrow 2 \text{NaClO}_3 (\text{s})$
 (E) $\text{NaClO}_4 (\text{s}) \rightarrow \text{NaCl} (\text{s}) + 2 \text{O}_2 (\text{g})$



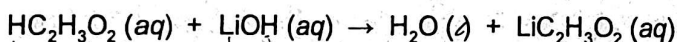
2. Which reactants produce $\text{Al}_2(\text{SO}_4)_3$ by double replacement?

- (A) $\text{Al} + \text{H}_2\text{SO}_4$ - single
 (B) $\text{AlSO}_2 + \text{O}_2$ single
 (C) $\text{Al}_2\text{O}_3 + \text{SO}_2$ not ionic, not double
 (D) $\text{AlCl}_3 + \text{H}_2\text{SO}_4$

3. What are the products of the complete combustion of propane, C_3H_8 , in oxygen?

- (A) carbon monoxide, CO, and hydrogen, H_2
 (B) carbon monoxide, CO, and water, H_2O
 (C) carbon dioxide, CO_2 , and hydrogen, H_2
 (D) carbon dioxide, CO_2 , and water, H_2O
- Combustion is always
 a hydrocarbon + oxygen \rightarrow
 carbon dioxide + water

4. The type of reaction illustrated by the equation below is _____.

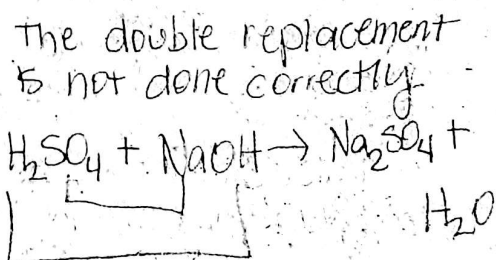


- (A) synthesis
 (B) decomposition
 (C) combustion
 (D) precipitation
 (E) acid-base neutralization

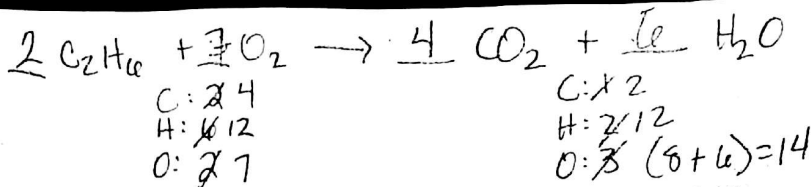
compound + compound \rightarrow compound + compound
 $\text{AB} + \text{CD} \rightarrow \text{AD} + \text{CB}$
 should read "Double replacement"
 since acids and bases have not yet
 been covered

5. Which of the following skeleton reactions is incorrect?

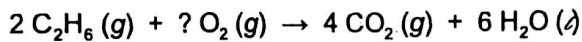
- (A) $\text{F}_2 (\text{g}) + \text{KI} (\text{aq}) \rightarrow \text{KF} (\text{aq}) + \text{I}_2 (\text{s})$
 (B) $\text{SiF}_4 (\text{l}) + \text{H}_2\text{O} (\text{l}) \rightarrow \text{Si}(\text{OH})_4 (\text{s}) + \text{HF} (\text{aq})$
 (C) $\text{H}_2\text{SO}_4 (\text{aq}) + \text{NaOH} (\text{aq}) \rightarrow \text{Na}_2\text{S} (\text{aq}) + \text{H}_2\text{O} (\text{l})$
 (D) $\text{C}_5\text{H}_{12} (\text{g}) + \text{O}_2 (\text{g}) \rightarrow \text{CO}_2 (\text{g}) + \text{H}_2\text{O} (\text{g})$
 (E) $\text{Na} (\text{s}) + \text{Cl}_2 (\text{g}) \rightarrow \text{NaCl} (\text{s})$



* The sodium needs sulfate
 not just sulfur



6. What is the coefficient of oxygen, O₂, in the balanced equation?



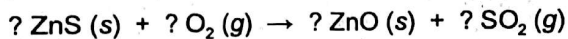
- (A) 3 (B) 4 (C) 6 (D) 7

7. Which equation best represents the decomposition of solid aluminum oxide when electricity is passed through it?

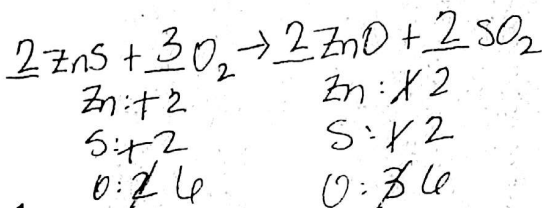
- (A) $2 AlO (s) \rightarrow 2 Al (s) + O_2 (g)$
 (B) $AlO (s) \rightarrow Al (s) + O (g)$
 (C) $2 Al_2O_3 (s) \rightarrow 4 Al (s) + 3 O_2 (g)$
 (D) $Al_3O_2 (s) \rightarrow 3 Al (s) + O_2 (g)$
 (E) $3 Al (s) + O_2 (g) \rightarrow Al_3O_2 (s)$

$Al^{+3} O^{2-}$
 Al_2O_3
 the only choice that correctly writes aluminum oxide

8. Which set of coefficients will balance this equation?



- (A) 1, 1, 1, 1 (B) 1, 2, 1, 1
 (C) 2, 3, 2, 2 (D) 2, 5, 2, 2



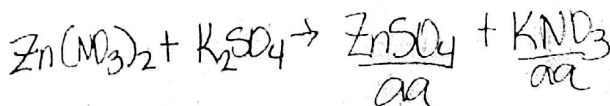
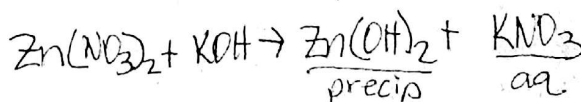
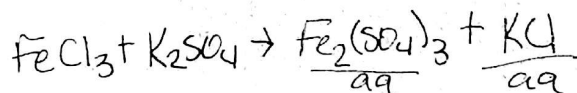
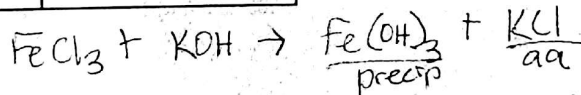
9. This table summarizes the results when solutions are added as indicated.

Solutions	KOH	K ₂ SO ₄
FeCl ₃	Precipitate Occurs	No Precipitate
Zn(NO ₃) ₂	Precipitate Occurs	No Precipitate

hydrates not soluble unless you have alkali metals
 Which substance is a precipitate?

- (A) $Fe_2(SO_4)_3$ sulfate soluble
 (B) $Fe(NO_3)_3$ nitrates are soluble
 (C) $Zn(OH)_2$
 (D) KNO_3

* Use solubility rules



Skeleton eqs