

Second Marking Period

Multiple Choice Homework

Each lecture in class is accompanied by five (5) multiple choice questions, which will be instrumental in helping you reinforce the material covered in class, and help you study for the test. ALL of the questions for a particular unit will be due the day of the test, when this booklet will be turned into me for a homework grade. If you finish a section before the day of the test I will grade it for you, allowing you to see which questions you missed, however I will not put a grade in the grade book for the homework till the day of the test. Meaning I will grade any section as many times as you like till you get all the questions correct. Do not miss the opportunity to earn an easy 100 in the grade book

Unit 4a Homework Questions

Metallic Bonds

- 1. Which of the following is a metallic substance?**
 - a. Ammonia gas
 - b. Solid magnesium carbonate
 - c. Tungsten filament
 - d. Carbon dioxide
- 2. An alloy is:**
 - a. A solution of two or more metals
 - b. A chemical reaction
 - c. A pure element on the periodic table, like brass or steel
 - d. A substance with properties that are a mix of two elements that form them, but comprised of neither elements.
- 3. Alloys come in two forms, substitution alloys are when one metal replaces another in the solution of metals and interstitial alloys which is when**
 - a. One metal reacts with another metal
 - b. Two metals react chemically forming a third metal
 - c. One metal fits into the spaces between the cations of another
 - d. A non-metal is introduced to the original metal and absorbed.
- 4. Which of the following accurately describes a metal?**
 - a. Anions with delocalized electrons
 - b. Cations with specialized electrons
 - c. Anions with specialized electrons
 - d. Cations with delocalized electrons
- 5. All of the following are properties of metals EXCEPT:**
 - a. For cations when introduced to nonmetals
 - b. Are brittle
 - c. Are shiny
 - d. Are excellent conductors of energy

Ionic Bonds

- 1. Which of the following is an ionic substance**
 - a. Ammonia gas
 - b. Solid magnesium carbonate
 - c. Tungsten filament
 - d. Carbon dioxide
- 2. Which of the following is held together with electrostatic forces**
 - a. HCN
 - b. H₂O
 - c. CH₄
 - d. O₂
- 3. Which of the following would have the largest lattice energy?**
 - a. CaCl₂
 - b. LiCl
 - c. MgF₂
 - d. NaCl
- 4. Which of the following would have the lowest melting point?**
 - a. LiF
 - b. FrI
 - c. Lil
 - d. FrF
- 5. Ionic compounds do not conduct electricity in the solid state because:**
 - a. They lack mobile particles that can carry a charge
 - b. They lack metals
 - c. They are magnetic
 - d. They have no electrons

Ionic Nomenclature

- 1. Which of the following formulas is incorrectly named:**
 - a. Lil – Lithium iodide
 - b. V₂O₃ – Vanadium (III) oxide
 - c. Na₂SO₃ – Sodium sulfite
 - d. FeO – Iron (I) oxide
- 2. What is the formula of ammonium dichromate?**
 - a. Am₂Cr₂O₇
 - b. NH₄Cr₂O₇
 - c. (NH₄)₂Cr₂O₇
 - d. NH₄Cr₂O₇
- 3. Which polyatomic ion below is named incorrectly?**
 - a. ClO₃⁻ = Chlorate
 - b. ClO₂⁻ = Chlorite
 - c. ClO⁻ = hypochlorite
 - d. ClO₄⁻ = perchlorite
- 4. Which of the following is the formula for Yttrium (IV) Carbonate?**
 - a. Y₂(CO₃)₄
 - b. Y(CO₃)₂
 - c. YCO₃
 - d. Y₄CO₃

5. Which of the following formulas is incorrectly paired with its name?
- a. $\text{Al}_2(\text{SO}_3)_3$ – Aluminum sulfate

- b. ZnCl_2 – Zinc chloride
 c. Na_2S – Sodium sulfide
 d. MgS – magnesium sulfide

Dissociation

1. When placed in water ionic compounds are separated by water molecules in a process called:

- a. Hydration
 b. Distillation
 c. Chromatography
 d. Electrostatic forces

2. Which would have the greatest conductivity?

- a. $\text{AgCl}_{(s)}$
 b. $\text{NaNO}_{3(aq)}$
 c. $\text{Al}_2(\text{CO}_3)_3(aq)$
 d. $\text{H}_2\text{O}_{(l)}$

3. Which of the following correctly shows the dissociation of sodium dichromate?

- a. $\text{Na}_2\text{Cr}_2\text{O}_7(s) \rightarrow \text{Na}^+_{(aq)} + \text{Cr}_2\text{O}_7^{2-}_{(aq)}$
 b. $\text{Na}_2\text{Cr}_2\text{O}_7(s) \rightarrow 2 \text{Na}^+_{(aq)} + \text{Cr}_2\text{O}_7^{2-}_{(aq)}$
 c. $\text{Na}_2\text{Cr}_2\text{O}_7(s) \rightarrow 2 \text{Na}^+_{(aq)} + 2\text{Cr}^{6+}_{(aq)} + 7\text{O}^{2-}_{(aq)}$
 d. $\text{Na}_2\text{Cr}_2\text{O}_7(s) \rightarrow \text{Na}_2\text{Cr}_2\text{O}_7(aq)$

4. Which of the following correctly shows the dissociation of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$), a non-electrolyte?

- a. $\text{C}_6\text{H}_{12}\text{O}_{6(s)} \rightarrow \text{C}_{6(aq)} + \text{H}_{12(aq)} + \text{O}_{6(aq)}$
 b. $\text{C}_6\text{H}_{12}\text{O}_{6(s)} \rightarrow 6 \text{C}^{4+} + 12 \text{H}^+ + 6\text{O}^{2-}$
 (aq)
 c. $\text{C}_6\text{H}_{12}\text{O}_{6(s)} \rightarrow 6\text{C}^{4+}_{(aq)} + \text{H}_{12}\text{O}_{6(aq)}$
 d. $\text{C}_6\text{H}_{12}\text{O}_{6(s)} \rightarrow \text{C}_6\text{H}_{12}\text{O}_{6(aq)}$

5. If an unknown solution is used to complete the circuit of a light bulb and a battery and the light bulb only lights up partially the substance in the solution is said to be a:

- a. Strong electrolyte
 b. Weak electrolyte
 c. Non-electrolyte
 d. ionic

Unit 4a Lecture Homework

Name: _____

Metallic Bonds

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Ionic Bonds

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Ionic Nomenclature

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Dissociation

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Unit 4b Homework Questions

Ionic vs covalent bonding

Use the following types of substances to answer the next three (3) questions

- a. Nonpolar covalent substance
- b. Polar covalent substance
- c. Ionic substance
- d. Network covalent substance

1. Carbon dioxide gas (CO_2)

2. Diamonds ($\text{C}_{\text{diamond}}$)

3. Epsom Salt (MgSO_4)

4. Which of the following statements regarding chemical bonding is FALSE?

- a. Ionic solids are held together by electrostatic forces
- b. Covalent molecules are held together by sharing electrons
- c. The total number of valence electrons for CCl_4 is 34
- d. Covalent molecules may not share electrons equally

5. Which of the following compounds contains both ionic and covalent bonds

- a. PO_4^{3-}
- b. NH_3
- c. MgF_2
- d. MgSO_3

Covalent Nomenclature

1. What is the formula of a compound whose nomenclature is silicon disulfide?

- a. Si_2S
- b. SiS_2
- c. 2SiS
- d. Si_2S_2

2. What is the formula of diarsenic heptoxide?

- a. As_7O_2
- b. As_2O_6
- c. As_6O_2
- d. As_2O_7

3. Which of the following compounds is INCORRECTLY paired

- a. NO_2 – mononitrogen dioxide
- b. Se_5O_{10} – pentaselenium decoxide
- c. PCl_3 – phosphorous trichloride
- d. SF_6 – sulfur hexafluoride

4. What is the formula of ammonia?

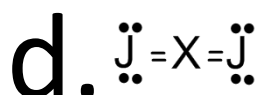
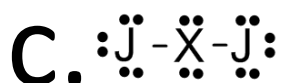
- a. NH_4^+
- b. NH_3
- c. Am
- d. NH_2

5. Which of the following names does not describe H_2O (HOH)?

- a. Dihydrogen monoxide
- b. Hydrogen dioxide
- c. Hydrogen hydroxide
- d. water

Drawing Lewis Structures

Use the following choices to answer the next four (4) questions



1. CO_2
2. O_2
3. F_2
4. SiO_2
5. All of the following guidelines apply to drawing Lewis structures of covalent compounds EXCEPT:
 - a. Only elements C, N, O, P, & S may form double bonds
 - b. H can never be the central atom of a covalent compound
 - c. Elements with a principle quantum number greater than 3 may have an expanded octet
 - d. Halogens are never the central atom of a covalent compound

Covalent bond theory

Use the following answers for the next two (2) questions

- a. F_2
 - b. N_2
 - c. CS_2
 - d. NO_2^-
1. Contains bonds longer than a double bond but shorter than a single bond
 2. Contains 2 sigma and 2 pi bonds
 3. Which of the following contains a triple bond?
 - a. F_2
 - b. N_2
 - c. CS_2
 - d. NO_2^-
 4. How many sigma and pi bonds does ethyne (C_2H_2) have?
 - a. 4σ & 2π
 - b. 5σ & 2π
 - c. 3σ & 2π
 - d. 4σ & 2π
 5. Which of the following does NOT satisfy the octet rule?
 - a. H_2O
 - b. BI_3
 - c. NO_2
 - d. CH_4

VSEPR model

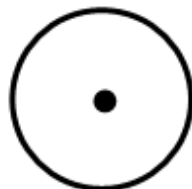
- Which of the following molecules is trigonal pyramidal?
 - CF₄
 - SCl₆
 - PF₃
 - PCl₅
- What shape best describes a BrF₄⁻ ion?
 - Tetrahedral
 - Square planar
 - See saw
 - Trigonal planar
- What type of hybridization is S exhibiting in the SCl₄ molecule?
 - sp
 - sp²
 - sp³
 - dsp³
- Which of the following molecules is INCONSISTANT with the hybridization state?
 - NH₃, sp³
 - PI₅, sp³d
 - XeS₄, sp³
 - SO₂, sp³
- The H-O-H bond angle in a water molecule, H₂O, is closest to:
 - 180°
 - 120°
 - 109°
 - 107°

Polarity

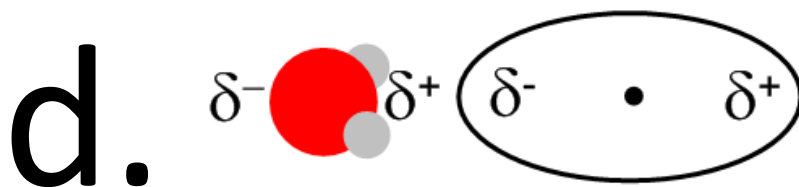
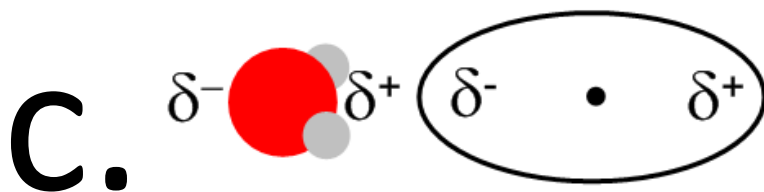
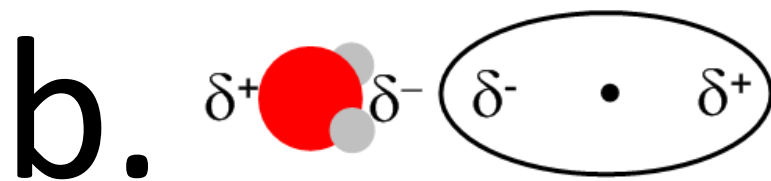
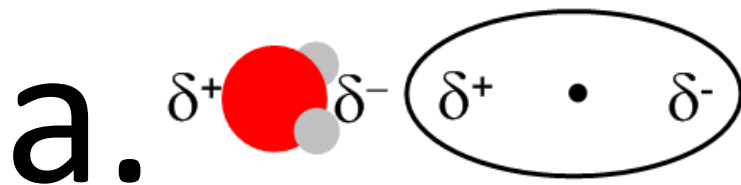
- Which of the following has the LEAST polar bond
 - F₂
 - HCl
 - CH₃Br
 - NCl₃
- Which of the following is both linear & polar?
 - HCN
 - CCl₄
 - N₂
 - H₂S
- Which of the following is nonpolar?
 - H₂O
 - BF₃
 - NF₃
 - HF
- All of the following are true of polar compounds EXCEPT:
 - They usually have higher boiling points than nonpolar substances
 - They dissolve polar compounds as well as ionic salts
 - They have areas of high electron density
 - They are comprised of metals and nonmetals
- Polar compounds can dissolve all of the following except:
 - Polar compounds
 - Ionic salts
 - Nonpolar compounds
 - Alcohols

Intermolecular forces

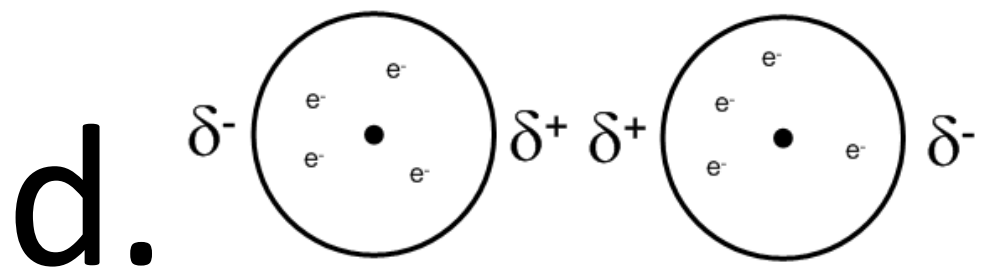
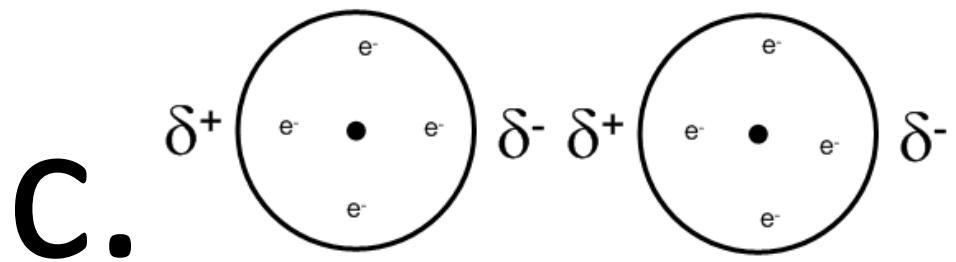
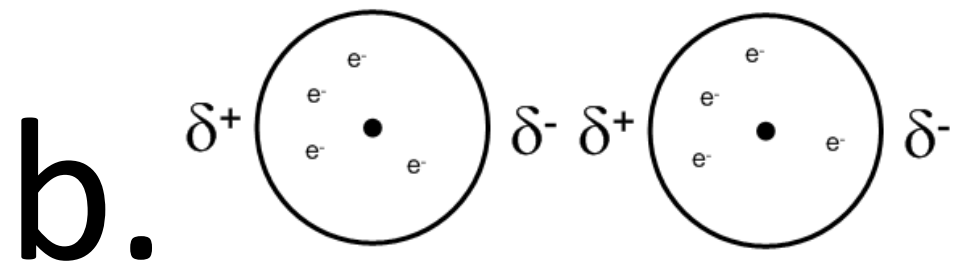
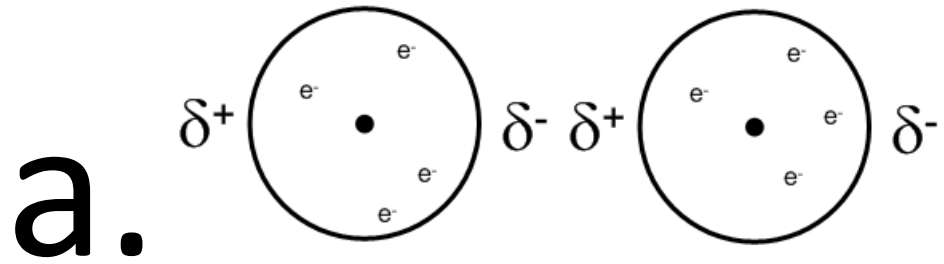
The next Two (2) questions refer to monoatomic molecule pictured below having no dipole moment. The dot indicates the location of the nucleus in all diagrams



1. The molecule is placed near a water molecule and experiences a dipole-induced dipole intermolecular force as a result. Which of the following best represents this interaction?



2. The molecule is placed near an identical molecule and experiences an induced-dipole (London dispersion) intermolecular force. Which of the following best represents this interaction?



3. Which of the following exhibits hydrogen bonding?

- a. BH_3
- b. HCl
- c. NF_3
- d. $\text{C}_2\text{H}_5\text{OH}$

4. What is the strongest attractive force being overcome when liquid water boils?

- a. Ionic bonds
- b. Covalent bonds
- c. Hydrogen bonds
- d. Dipole-dipole bonds

5. Which of the following would you expect to have the highest boiling point?

- a. Ne
- b. F_2
- c. CO_2
- d. CH_4

Unit 4b Lecture Homework

Name: _____

Ionic vs covalent bonds

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Covalent nomenclature

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Drawing Lewis Structures

1. A B C D
2. A B C D
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Covalent Bond Theory

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

VSEPR Model

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Polarity

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Intermolecular forces

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Unit 5 & 6 Homework Questions

The Mole

Use the following chemicals for the next two (2) questions. Choices maybe used once, more than once, or not at all

	Chemical Formula	Molar Mass
A	H ₂ O	18.0
B	CaSO ₄	136
C	CO ₂	44.0
D	NaOH	40.0

- 44.0 g of this compound will contain 1.204×10^{24} atoms of oxygen**
- 0.50 moles of this compound has a mass of 22.0 g**
- A student measures out 360 g of glucose, C₆H₁₂O₆, (molar mass = 180) the primary energy molecule for carbon based life. How many atoms of oxygen at in the students sample?**
 - 3.61×10^{24}
 - 6.02×10^{23}
 - 1.2×10^{24}
 - 7.22×10^{24}
- A student measured out 0.333 moles of theobromine, C₇H₈N₄O₂ (MM = 180^{g/mol}) the primary alkaloid found in chocolate. How many molecules of theobromide did the student measure**
 - 2.0×10^{23}
 - 1.8×10^{24}
 - 6.0×10^{23}
 - 1.2×10^{24}
- The mass of 1.204×10^{24} atoms of hydrogen is equal to**
 - 1.01 grams
 - 2.02 grams
 - 3.03 grams
 - 4.04 grams

Percent Composition

1. Which of the following has the greatest percent oxygen?

- a. Fe_2O_3
- b. H_2O
- c. CO_2
- d. $\text{C}_6\text{H}_{12}\text{O}_6$

2. Which of the following combinations is INCORRECT?

a	LiCl	16.5% lithium
b	LiHCO_3	10.3% lithium
c	$\text{Li}_2\text{C}_2\text{O}_4$	6.7% lithium
d	Li_2O	46.7% lithium

3. What is the percent sulfur in the sulfate ion (SO_4^{2-})

- a. 20.0%
- b. 25.0%
- c. 33.3%
- d. 50.0%

4. Which iron ore would yield the most iron when treated?

- a. FeO
- b. Fe_2O_3
- c. FeCO_3
- d. $\text{Fe}_2(\text{CO}_3)_3$

5. If substance X_2J is 40% X by mass, what mass of element J can be refined from 50.0g of X_2J ore?

- a. 25.0g
- b. 20.0g
- c. 10.0g
- d. 50.0g

Chemical Formulas

1. All of the following are molecular formulas EXCEPT

- a. $\text{C}_2\text{H}_4\text{O}_2$
- b. C_8H_8
- c. $\text{C}_2\text{H}_3\text{O}_2$
- d. $\text{C}_4\text{H}_8\text{O}_2$

2. Which of the following are NOT empirical formulas

- a. MgCl_2
- b. CH_2O
- c. H_2O
- d. As_4O_{10}

3. If a compound's empirical formula is CH_2 , and has a molar mass of 70 g/mol , what is its molecular formula?

- a. C_5H_{10}
- b. CH_2
- c. C_3H_6
- d. $\text{C}_{10}\text{H}_{20}$

4. All of the following would have an empirical formula of PCl_3 EXCEPT:

- a. P_2Cl_6
- b. P_3Cl_9
- c. P_4Cl_{12}
- d. P_5Cl_{20}

5. The empirical formula for nitrogen dioxide is:

- a. NO_2
- b. NO
- c. N_2O_4
- d. $\text{N}_{1/2}\text{O}$

Analytical chemistry

1. A compound contains 31.25% calcium, 18.75% carbon and 50% oxygen. What is the empirical formula for the compound?

- a. CaCO_3
- b. CaCO_4
- c. CaC_2O_4
- d. $\text{Ca}_5\text{C}_3\text{O}_8$

2. A certain hydrocarbon was found to have the empirical formula C_2H_5 , its molar mass was determined to be $58^{\text{g}}/\text{mol}$. What is its molecular formula?

- a. C_2H_5
- b. C_3H_7
- c. C_4H_{10}
- d. CH_2

3. A certain compound was analyzed and found to have 12.0 g C, and 2g H.

What is the empirical formula?

- a. C_6H
- b. CH_2
- c. C_2H_4
- d. CH_3

4. A compound contains 3.648g N and 6.316g O, what is the empirical formula for this solid?

- a. N_3O_6
- b. NO_2
- c. NO_2
- d. N_2O_3

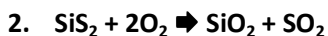
5. A compound containing only hydrogen and sulfur and is 5.9% hydrogen would have an empirical formula of:

- a. H_2S
- b. HS
- c. H_3S
- d. H_6S

Types of Chemical Reactions

Refer to the following equations for the next three (3) questions. Choice maybe used once, more than once, or not at all.

- a. Combustion
- b. Synthesis
- c. Decomposition
- d. Single displacement



4. Which of the following is a synthesis reaction?

- a. $2\text{C}_2\text{H}_6 + 7\text{O}_2 \rightarrow 4\text{CO}_2 + 6\text{H}_2\text{O}$
- b. $\text{Mn} + \text{ZnCl}_2 \rightarrow \text{Zn} + \text{MnCl}_2$
- c. $2\text{Na} + \text{I}_2 \rightarrow 2\text{NaI}$
- d. $2\text{LiBrO}_3 \rightarrow 3\text{LiBr} + 3\text{O}_2$

5. Which of the following is a single replacement reaction?

- a. $\text{Si} + \text{O}_2 \rightarrow \text{SiO}_2$
- b. $\text{Co} + 2\text{AuNO}_3 \rightarrow \text{Co}(\text{NO}_3)_2 + 2\text{Au}$
- c. $\text{H}_2\text{O} + \text{SO}_2 \rightarrow \text{H}_2\text{SO}_3$
- d. $\text{KClO}_4 \rightarrow \text{KCl} + 2\text{O}_2$

Balancing Chemical Equations

1. Which of the following is incorrectly balanced?

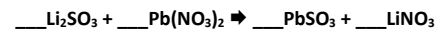
- a. $2\text{C}_2\text{H}_6 + 7\text{O}_2 \rightarrow 4\text{CO}_2 + 6\text{H}_2\text{O}$
- b. $\text{Mn} + \text{ZnCl}_2 \rightarrow \text{Zn} + \text{MnCl}_2$
- c. $2\text{Na} + \text{I}_2 \rightarrow 2\text{NaI}$
- d. $2\text{LiBrO}_3 \rightarrow 3\text{LiBr} + 3\text{O}_2$

2. When the equation below is correctly balanced, the coefficient of oxygen is:



- a. 7
- b. 11
- c. 16
- d. 30

4. When the equation below is correctly balanced, the coefficient of PbSO_3 is:



- a. 0
- b. 1
- c. 2
- d. 3

3. When the equation below is correctly balanced, the sum of the coefficients is



- a. 4
- b. 6
- c. 7
- d. 9

5. When the equation below is balanced what is the sum of the coefficients?



- a. 3
- b. 5
- c. 6
- d. 9

Unit 5 and 6 Homework

Name: _____

The Mole

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Percent Composition

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Chemical formulas

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Analytical Chemistry

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Types of Reactions

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Balancing Reactions

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D