REVIEW QUESTIONS
Chapter 3

1. Using only a periodic table, assign charges for each ion below, then complete the table with formulas and names for compounds formed by the combination of each cation and anion.

	Ca ____	K ____	Al____	NH_4___
S___				
Cl___				
N___				
NO_2 ___				
SO_4 ____				
NO_3 ____				
CO_3 ____				
ClO_3 ____				
OH ____				
PO_4____				

2. Fill in the missing name or formula for each compound listed below. Fill in column 1 without using any notes, and then fill in column 2 with the use of notes.

	1	2
Barium nitrate		
Ferrous chloride		
Silver hydroxide		
Strontium phosphate		
Copper(II) acetate		
Zinc nitrite		
Potassium sulfite		
Ammonium carbonate		
Iodine heptafluoride		
Bromine trifluoride		
$CuClO_4$		
Ag_2SO_4		
N_2O_5		
Hg_2I_2		
PbO_2		
OF_2		

3. For each compound shown below, determine if the name or formula is incorrect, and write the correct form in the space provided:

a)	Ag_2S	Disilver sulfide	_____
b)	MgOH	Magnesium hydroxide	_____
c)	$Ca(NO_3)_2$	Calcium (II) nitrate	_____
d)	SnO_2	Tin (II) oxide	_____
e)	PbS	Lead sulfide	_____
f)	$ZnCl_2$	Zinc dichloride	_____
g)	SO_2	Sodium dioxide	_____
h)	$CaSO_4$	Calcium sulfide	_____
i)	Ba_2O	Barium oxide	_____
j)	Cu_2O	Copper (II) oxide	_____

4. Balance the following equations by providing the missing coefficients:

a) ____NH_4NO_3 → ____N_2O + ____H_2O

b) ____Mg_3N_2 + ____H_2O → ____$Mg(OH)_2$ + ____NH_3

c) ____NCl_3 + ____H_2O → ____NH_3 + ____HOCl

d) ____$C_5H_{10}O_2$ + ____O_2 → ____CO_2 + _____H_2O

e) ____$(NH_4)_2Cr_2O_7$ → _____N_2 + _____Cr_2O_3 + _____H_2O

f) ____PCl_5 + _____H_2O → _____H_3PO_4 + _____HCl

5. Write a balanced equation for each reaction described below. Include state designations:

   a) When an aqueous solution of potassium dichromate is added to and aqueous solution of lead(II) nitrate, solid lead(II) dichromate and aqueous potassium nitrate are formed.

   b) When chlorine gas is bubbled though an aqueous solution of potassium bromide, bromine gas and aqueous potassium chloride are formed.

   c) When zinc metal is reaction with aqueous nitric acid, the reaction produces nitrogen gas, water and aqueous zinc nitrate.

6. What mass of chlorine is present in 12.2 g of $PbCl_2$?

7. How many atoms of oxygen are present in 2.15 g of $Ca_3(PO_4)_2$?

8. What is the percent composition of caffeine ($C_8H_{10}N_4O_2$)?

9. Determine the empirical formula for a compound with the following composition:

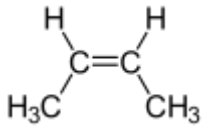
62.1% C 5.21% H 12.1% N 20.7% O

10. Combustion analysis of a 12.01-g sample of an unknown acid–which contains only carbon, hydrogen and oxygen–produced 14.08 g CO_2 and 4.32 g H_2O. Determine the empirical formula for this acid.

11. A phosphorous compound that contains 34.00% phosphorus by mass has the formula X_3P_2. Identify the element X.

12. A 3.41-g sample of a hydrate of copper(II) chloride was heated to drive off the water of hydration. The anhydrous salt was found to have a mass of 2.69 g. Determine the formula for this hydrate.

13. Classify each hydrocarbon below as alkane, alkene or alkyne, and write a molecular formula for each:

a) 

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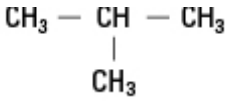
c) 

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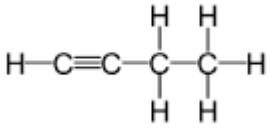
b) 

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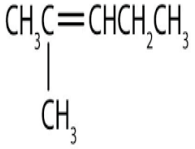
d) 

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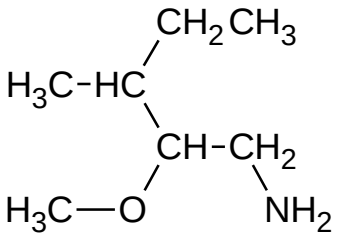
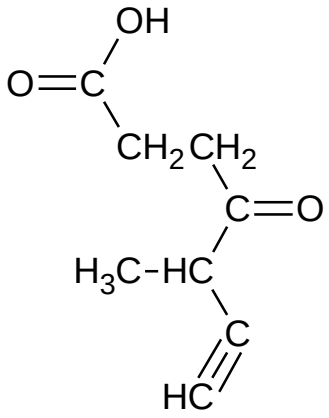
14. Identify the functional groups present in the structures below:

a)



b)



c)