

Chem 1014  
Review In-Class Problem Set  
November 11, 1999  
Fall 1999

Name \_\_\_\_\_  
TA Name \_\_\_\_\_  
Lab Section # \_\_\_\_\_

Here are some extra problems to practice.

1a. Define the term *valence electron(s)*.

b) How many valence electrons do each of the following elements have?

Na \_\_\_\_ Sr \_\_\_\_ P \_\_\_\_ I \_\_\_\_ Kr \_\_\_\_

2. Predict the formula of the ionic compound formed between the following pairs of elements.

- a) Na and Br<sub>2</sub>
- b) Al and O<sub>2</sub>
- c) Ba and S
- d) Fe and Cl<sub>2</sub>
- e) gallium and oxygen
- f) aluminum and sulfate
- g) magnesium and chlorine
- h) calcium and phosphate
- i) iron and nitrate

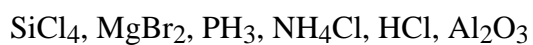
3. Predict the formula of the covalent compound formed between the following pairs of elements.

- a) H<sub>2</sub> and O<sub>2</sub>
- b) H<sub>2</sub> and Br<sub>2</sub>
- c) C and O<sub>2</sub>
- d) N<sub>2</sub> and Cl<sub>2</sub>
- e) nitrogen and oxygen

4. Complete the following table;

Name of the compound	Formula of the compound
	NaOH
silver chloride	
	Li <sub>3</sub> N
aluminum oxide	
	KNO <sub>3</sub>
barium sulfate	
potassium phosphate	
	NH <sub>3</sub>
	CO <sub>2</sub>
sulfur trioxide	
	Pb(NO <sub>3</sub> ) <sub>2</sub>
barium carbonate	

5. Predict whether the following compounds are ionic or covalent.



6. Draw the Lewis (electron) structure for the following ions or molecules.

a) HBr

b) PCl<sub>3</sub>

6. (CONTINUED)

e)  $C_2H_4$

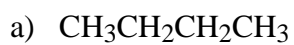
f)  $CH_2Cl_2$

g)  $Cl_2CO$

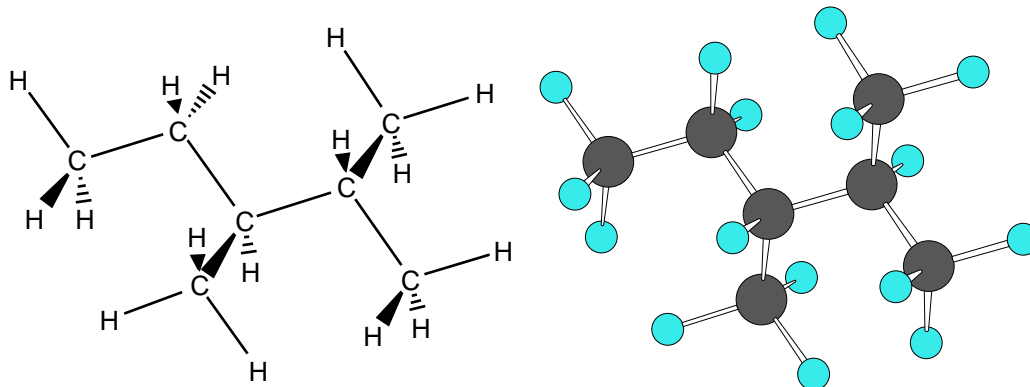
h)  $HCN$

7. What are 'normal' hydrocarbons? What are branched-chain hydrocarbons? In each case site at least three examples.

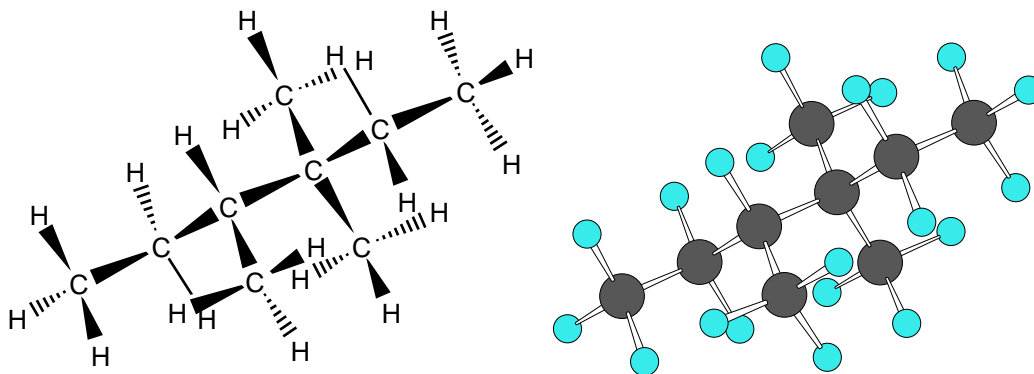
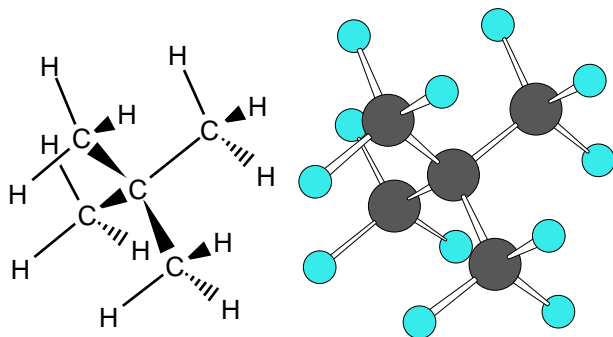
8. Name the following compounds;



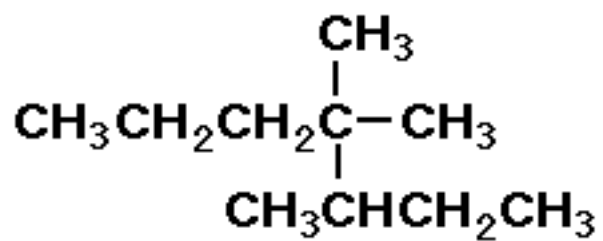
b)



c)



e)



9. Draw the structure that corresponds with each of the following names.

a) 3-ethyloctane

b) 2,2,4,4-tetramethylhexane

c) 2,3-dimethyl-4-ethylnonane

d) 2,2,4-trimethylpentane

9. CONTINUED

e) 3-ethyl-2-methylpentane

f) 4-ethyl-2,4-dimethyldecane

10. What are structural isomers? Draw and name all (part a) of the structural isomers for each of the following compounds;

a)  $C_5H_{12}$

b) 5 isomers of  $C_{10}H_{22}$

