Chemistry 20: Bonding Unit
Lewis, Structural and Shape Diagram WS

Name: /

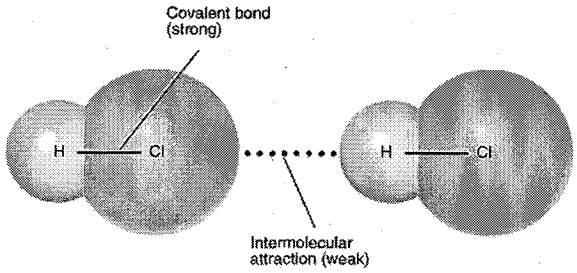
For the following compounds, draw the Lewis Dot diagram, the structural diagram and the Shape Diagram. Also, indicate the name of the shape ~~and the shape code~~ in the same box as the shape diagram.

	Lewis Diagram	Structural Diagram	Shape Diagram & Name
SO			
$CHCl_3$			
NCl_3			
HCl			

	Lewis Diagram	Structural Diagram	Shape Diagram, Name
H_2S			
C_2H_6			
CH_3CN			
OF_2			

Chemistry 20: Unit 4: Bonding
Intermolecular Bonding WS

Name:
/



1. Which has a higher boiling point, I_2 or Br_2? Why?

2. Ethanol C_2H_5OH and methyl ether CH_3OCH_3 have the same molar mass. Which has a higher boiling point? Explain why? Draw a shape diagram of each.

3. Which has the higher boiling point, Br_2 or ICl? Why?

4. Rank the strength of the intermolecular forces found between molecules of following compounds (from strongest to weakest) PCl_3, $NiCl_2$, I_2, HF

5. Rank the following from strongest to weakest intermolecular forces.
   Cl_2, CH_4, BF_3, SCl_2, CO_2

Melting Points and Boiling Points of Substances with Similar Formula Weights			
Substance	FW (g/mol)	mp (°C)	bp (°C)
F_2	38	-220	-188
NO	30	-164	-152
CH_3OH	32	-94	65

6. All the substances in this table have similar formula weights thus they have similar London forces. If the only attractions between substances have to do with size, then they should have similar melting points and boiling points. This is not the case.

Explain why the pairs of compounds below have different m.p. and b.p.

a. Fluorine and Nitrogen Monoxide

b. Nitrogen Monoxide and Methanol

7. Which of the following compounds are likely to dissolve in water? Which of the following will dissolve in C_6H_{14} (hexane)?

a. SCl_2
b. O_2
c. NaCl
d. CO_2
e. PH_3

Chemistry 20
Unit 1 – Chemical Bonding
Unit Review
March 9, 2007

---

1) Is fluorine or iodine more reactive? Why?

2) Is francium or lithium more reactive? Why?

3) Write the half reaction equation for each of the following elements and classify the reaction as oxidation or reduction.

   a. nitrogen

   b. potassium

   c. magnesium

   d. bromine

4) Write the oxidation, reduction and net equation for each reaction and compound.

a. hydrogen gas + oxygen gas

b. $Sr_3P_{2\,(s)}$

5) Draw the Lewis Dot diagram for each element.

a. phosphorus

b. calcium

c. neon

6) Draw the Lewis Dot diagram for each substance. Some are ionic and some are molecular!

a. NaCl

b. $SiCl_4$

c. CO_2

d. Li_3N

7) What is the bonding capacity of the following elements?

a. carbon

b. argon

c. bromine

8) Draw the structural **and** shape diagrams for each of the following molecules. Write the shape code and shape name, as well.

a. CH_3F

b. $SiCl_2$

c. $HCOOCH_3$

d. C_2F_2

9) Identify each of the following molecules as polar, non-polar or ionic. Draw the bond diagram for each.

a. CH_3CP

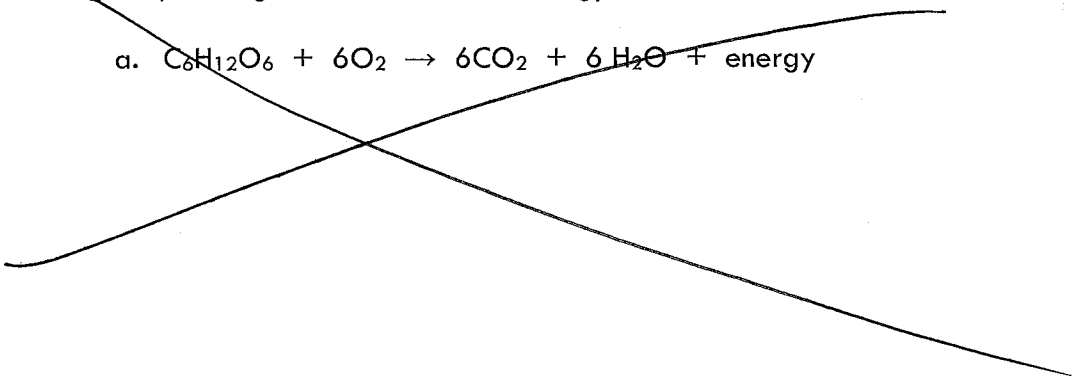
b. H_2O_2

c. CS_2

d. NF_3

10) Is the following equation (for cellular respiration) endothermic or exothermic? Explain, making reference to bond energy.

a. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O +$ energy



11) Identify the intermolecular forces acting on each molecule.

a. CS_2

b. H_2O_2

c. C_2H_5OH

d. HF