

Name: _____

Period: _____

Seat#: _____

Directions: Try these problems. If you can DO them, check the box (☑).
 If you CANNOT do them, write some notes TO YOURSELF about what you need to study to succeed at these problems.

S62 – Quick Check #1

IMF Identification

Indicate the **strongest** IMF holding together crystals of the following substances:

		London forces	Dipole-dipole attractions	Hydrogen bonding	Metallic bonding	Ionic bonding	Covalent bonding
1.	KCl						
2.	IF ₃						
3.	HF						
4.	AsH ₃						
5.	Br ₂						
6.	Pt						
7.	NaOH						
8.	H ₂ S						
9.	Ne						
10.	SiO ₂						

Describe the interparticle forces at work in the following:

- | | |
|--|---|
| | a. within a water molecule H ₂ O |
| | b. in a crystal of the salt NaCl |
| | c. in a solution of potassium nitrate KNO ₃ |
| | d. in diamond |
| | e. in a fiber of nylon |
| | f. in liquid butane |
| | g. between water molecules in ice |
| | h. between the two strands in the double helix of DNA |
| | i. in paraffin wax |
| | j. between the molecules of carbon dioxide CO ₂ in dry ice |
| | k. between the molecules of HCl in liquid HCl |
| | l. in tungsten metal |
| | m. in a solution of perchloric acid |

Type of Bonds

Elemental boron is extremely hard (nearly as hard as diamond) and has a melting point of 2300°C. It is a poor conductor of electricity at room temperature. What kind of solid would you expect for boron based on these properties? _____

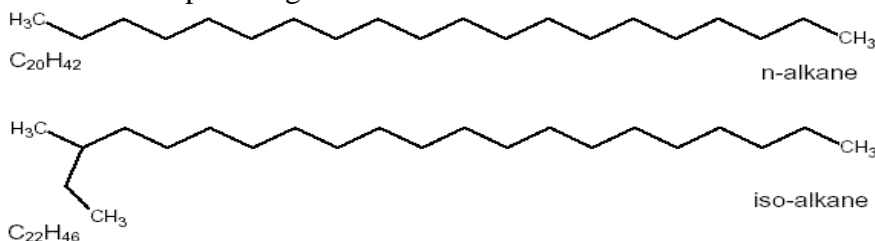
- A. molecular solid B. metal C. ionic solid D. covalent/network solid

Valence electrons delocalized over huge arrays of atoms.
What kind of solid is described by this property? _____

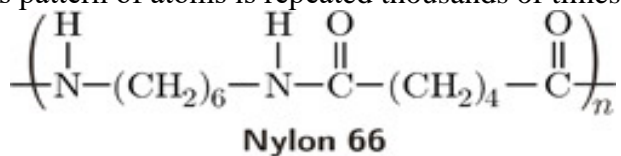
- A. molecular solid B. metal C. ionic solid D. covalent/network solid

Some information that is considered “common knowledge” for AP Chemistry students:

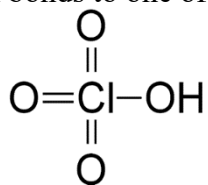
Paraffin wax is made up of long carbon chains. The Alkanes area also called the Paraffins.



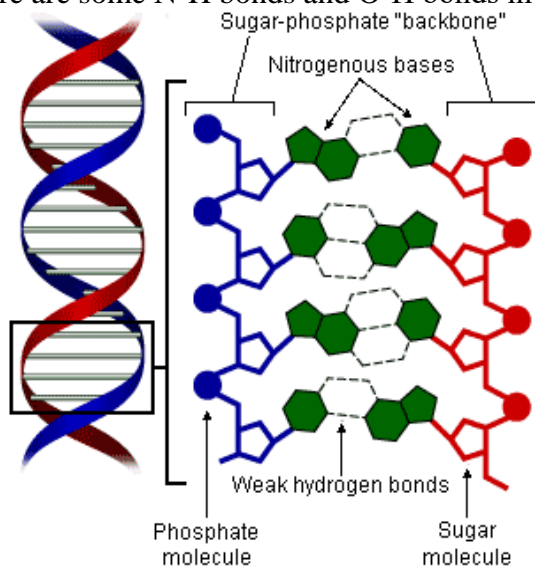
Nylon is a polymer made up of long chains of carbons with amine groups and C=O groups. The “n” means that this pattern of atoms is repeated thousands of times to make nylon fibers.



Perchloric acid is based on the perchlorate ion (ClO_4^-).
This is an “oxoacid” where the H atom bonds to one of the oxygen atoms.



DNA has a familiar structure, but we are interested in how the two sides of DNA are connected to each other. Note that there are some N-H bonds and O-H bonds in the “Nitrogenous bases”.



Struggled? Got some wrong? Do some self-study!

S63 – Quick Check #2

□ Explaining Problems (from the 1994 AP Exam)

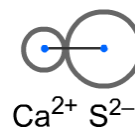
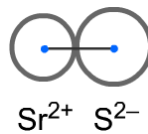
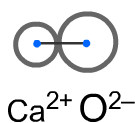
For each of the following, use appropriate chemical principles to explain the observation.

At room temperature, NH_3 is a gas and H_2O is a liquid, even though NH_3 has a molar mass of 17 grams and H_2O has a molar mass of 18 grams.

$\text{C}_{(\text{graphite})}$ is used as a lubricant, whereas $\text{C}_{(\text{diamond})}$ is used as an abrasive.

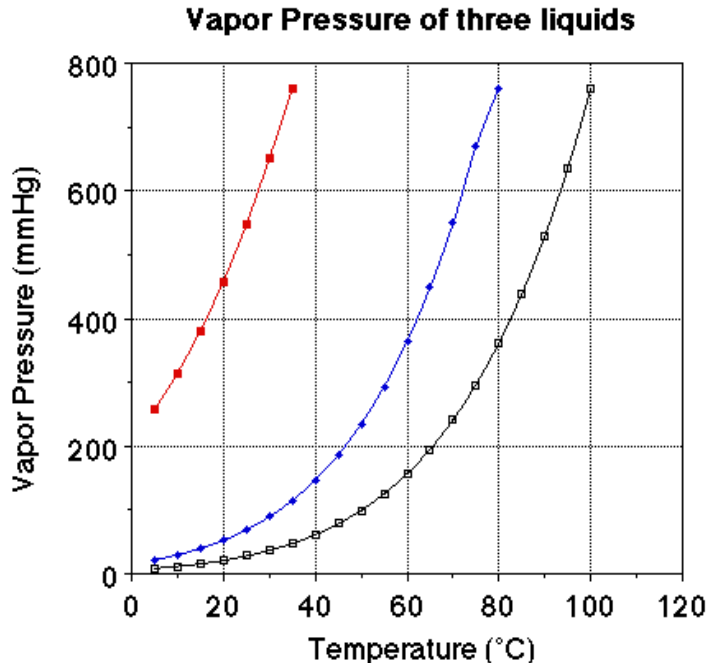
□ Strength of Ionic Bonds

Consider these three ionic compounds:



Which one of these has the strongest ionic bond? _____ Explain your answer.

□ Boiling



What are the normal boiling points of the three liquids?

Indicate which liquid has the **weakest** IMF's.