

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Period: \_\_\_\_\_

Seat #: \_\_\_\_\_

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.

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 <sub>3</sub>						
3.	HF						
4.	AsH <sub>3</sub>						
5.	Br <sub>2</sub>						
6.	Pt						
7.	NaOH						
8.	H <sub>2</sub> S						
9.	Ne						
10.	SiO <sub>2</sub>						

Describe the interparticle forces at work in the following:

- |       |    |  |
|-------|----|--|
| _____ | a. | <b>within</b> a water molecule H <sub>2</sub> O                    |
| _____ | b. | in a crystal of the salt NaCl                                      |
| _____ | c. | in a <b>solution</b> of potassium nitrate KNO <sub>3</sub>         |
| _____ | d. | in diamond   |
| _____ | e. | in a fiber of nylon  |
| _____ | f. | in liquid butane   |
| _____ | g. | <b>between</b> 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 <sub>2</sub> in dry ice |
| _____ | k. | between the molecules of HCl in <b>liquid</b> HCl                  |
| _____ | l. | in tungsten metal  |
| _____ | m. | in a solution of perchloric acid                                   |

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? \_\_\_\_

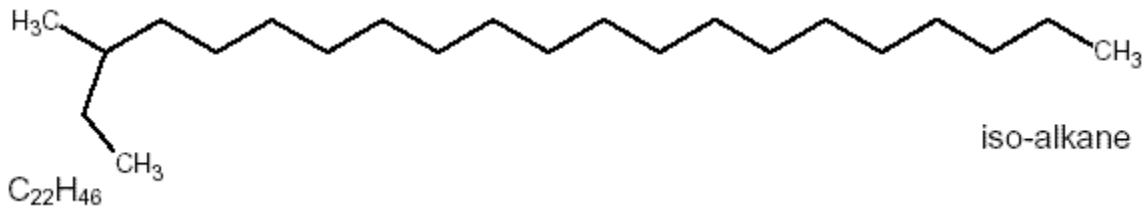
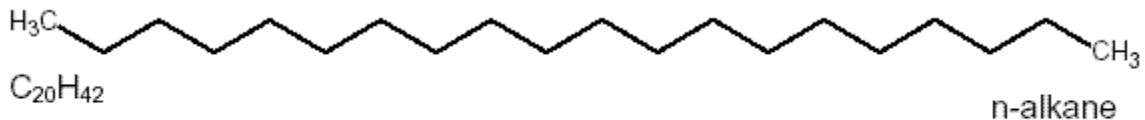
- A. molecular solid      B. metal      C. ionic solid      D. covalent/network solid

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

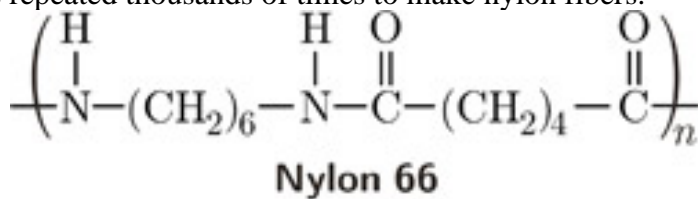
- A. molecular solid      B. metal      C. ionic solid      D. covalent/network solid

Notes about structures that are considered "common knowledge" for AP chemistry students:

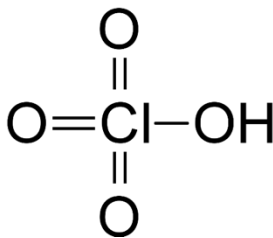
**Paraffin wax** is made up of long carbon chains. The Alkanes area also called the Paraffins.



**Nylon** is a polymer made up of long chains of carbons with amine groups and  $\text{C}=\text{O}$  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 ( $\text{ClO}_4^-$ ). 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".

