

## Chemistry - Solids Questions

1. Identify the attractive force (IMF or chemical bond) that holds the following solid types together as a solid.

- a) molecular solids \_\_\_\_\_ d) metallic solids \_\_\_\_\_  
b) covalent network solids \_\_\_\_\_ e) amorphous solids \_\_\_\_\_  
c) ionic solids \_\_\_\_\_

2. Sketch a 2-dimensional diagram depicting the bonding found in solid...

NaF

Mg

4. Using the diagrams you drew above, answer the following questions:

a) Why are ionic solids brittle?

b) Why are ionic solids hard?

c) Why are metallic solids malleable?

d) Why are metals generally good electrical conductors?

e) Why are ionic solids insulators?

f) Why are ionic compounds conductors if melted or dissolved?

4. Why is  $I_2$  a solid at room temperature, where  $Br_2$  is a liquid and  $F_2$  and  $Cl_2$  are gases?

5. Identify the specific type of attractive force (bond or IMF) that must be overcome to:

- (a) melt ammonia,  $NH_3$   
(b) melt calcium carbonate,  $CaCO_3$   
(c) melt copper  
(d) melt wax

6. Which of the following substance would you expect would dissolve in water the easiest?  $C_8H_{18}$ , Cr,  $CaCl_2$  Why?

7. What is the primary difference between a crystalline solid and an amorphous solid.

8. List the four types of crystalline solids.

1) \_\_\_\_\_ 3) \_\_\_\_\_

2) \_\_\_\_\_ 4) \_\_\_\_\_

9. Describe how you would determine the type of attractive force (bond or IMF) employed by a given solid.

10. Rank order the following substances in order of decreasing melting points:  $\text{PbF}_2$ ,  $\text{TlF}_3$ ,  $\text{TlF}$ ,  $\text{PbF}_4$ ,  $\text{TlF}_5$

\_\_\_\_\_

lowest m.p.                      highest m.p.

11. State the general rule for predicting the solubility of a solid in a liquid solvent. Give two examples of this rule.

12. Rank order the following substances in order of increasing melting points:

$\text{CsF}$ ,  $\text{NaF}$ ,  $\text{LiF}$ ,  $\text{KF}$ ,  $\text{RbF}$

\_\_\_\_\_

lowest m.p.                      highest m.p.

13. Specifically, why does  $\text{CaCl}_2$  have a higher melting point than  $\text{BaCl}_2$ ?

14. Identify the type of attractive force (bond or IMF) that must be overcome in order to:

a) melt wax ( $\text{C}_{28}\text{H}_{58}$ ) \_\_\_\_\_

e) melt ice \_\_\_\_\_

b) melt  $\text{CH}_2\text{F}_2$  \_\_\_\_\_

f) melt a diamond \_\_\_\_\_

c) melt a coin \_\_\_\_\_

g) melt table salt \_\_\_\_\_

d) melt a rock \_\_\_\_\_

h) melt steel \_\_\_\_\_

15. What is the difference between the covalent bonding found in a molecular solid and the covalent bonding found in a covalent network solid?

16. In terms of lattice energy, why do some ionic solids dissolve in water, while others do not?

## Chemistry

### Attractive Forces Questions

1. What are the two types of attractive forces?

- 1) \_\_\_\_\_ 2) \_\_\_\_\_

2. What are the three types of chemical bonds?

- 1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_

2. What are the three types of IMF's?

- 1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_

3. Among similar size molecules, which IMF is the strongest? The weakest?

4. In general what are the stronger attractive forces, chemical bonds or IMF's?

5. Fill in the blank: Chemical bonds result in the formation of \_\_\_\_\_, while IMF's generally effect the \_\_\_\_\_ of a substance, hold \_\_\_\_\_ and some \_\_\_\_\_ together, and keep the components of a \_\_\_\_\_ mixed together.

6. Fill in the blank: Chemical bonds are found \_\_\_\_\_ a molecule or compound, while IMF's are found \_\_\_\_\_ molecules.

7. Fill in the blanks: In order to boil or evaporate a liquid, one has to break the \_\_\_\_\_ holding the liquid together as a liquid.

8. Fill in the blanks: In order to melt a solid, one has to break the \_\_\_\_\_ or \_\_\_\_\_ holding the solid together as a solid.