

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: PbF_2 , TlF_3 , TlF , PbF_4 , 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:

CsF , NaF , LiF , KF , RbF

lowest m.p. highest m.p.

13. Specifically, why does CaCl_2 have a higher melting point than 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 CH_2F_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.