

Name: \_\_\_\_\_  
 INTERMOLECULAR ATTRACTIONS WORKSHEET

- \_\_\_ 1) Which liquid has the *weakest* intermolecular forces of attraction between its molecules?  
 A) Ne( $\ell$ )                      B) Kr( $\ell$ )                      C) He( $\ell$ )                      D) Xe( $\ell$ )
- \_\_\_ 2) Compared to the boiling point of H<sub>2</sub>S, the boiling point of H<sub>2</sub>O is relatively high. Which type of bonding causes this difference?  
 A) hydrogen                      B) covalent                      C) network                      D) ionic
- \_\_\_ 3) Which attractions allow molecules of krypton to exist in the solid phase?  
 A) weak intermolecular forces                      C) ionic bonds  
 B) molecule-ion forces                      D) covalent bonds
- \_\_\_ 4) What is the predominate type of attraction between molecules of HF in the liquid state?  
 A) covalent bonding                      C) hydrogen bonding  
 B) ionic bonding                      D) electrovalent bonding
- \_\_\_ 5) Molecules in a sample of NH<sub>3</sub>( $\ell$ ) are held closely together by intermolecular forces  
 A) caused by different numbers of neutrons                      C) caused by unequal charge distribution  
 B) existing between ions                      D) existing between electrons
- \_\_\_ 6) Which compound has the *lowest* normal boiling point?  
 A) H<sub>2</sub>S                      B) NH<sub>3</sub>                      C) HCl                      D) H<sub>2</sub>
- \_\_\_ 7) As the distance between two bromine molecules increases, the magnitude of the intermolecular forces of attraction between them  
 A) remains the same                      B) increases                      C) decreases
- \_\_\_ 8) The table below shows boiling points for the elements listed.

<u>ELEMENTS</u>	<u>Normal Boiling Points (°C)</u>
Fluorine	-188.1
Chlorine	-34.6
Bromine	+58.8
Iodine	+184.4

Which of the following statements *best* explains the pattern of boiling points relative to molecular size?

- A) Stronger intermolecular forces occur in larger molecules.  
 B) Weaker intermolecular forces occur in larger molecules.  
 C) Weaker hydrogen bonds occur in larger molecules.  
 D) Stronger hydrogen bonds occur in larger molecules.
- \_\_\_ 9) In an aqueous solution of an ionic salt, the oxygen atom of the water molecule is attracted to the  
 A) negative ion of the salt, due to oxygen's partial positive charge  
 B) positive ion of the salt, due to oxygen's partial negative charge  
 C) positive ion of the salt, due to oxygen's partial positive charge  
 D) negative ion of the salt, due to oxygen's partial negative charge
- \_\_\_ 10) Molecule-ion attractions are found in  
 A) CO(g)                      B) NaCl(aq)                      C) Cu(s)                      D) KBr( $\ell$ )

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## PROPERTIES OF SOLIDS WORKSHEET

Questions 1 through 5 refer to the following:

In the laboratory, a student compares the properties of two unknown solids. The results of his experiment are reported in the data table below.

	Substance A	Substance B
Melting Point	low	high
Solubility in Water	nearly insoluble	soluble
Hardness	soft, waxy crystals	hard crystals
Electrical Conductivity	poor conductor in both solid and aqueous states	poor conductor in the solid state, but good conductor in the aqueous state

- Predict the type of bonding in substance *A*.
- Predict the type of bonding in substance *B*.
- Explain, in terms of attractions, why substance *B* is soluble in water.
- Explain, in terms of attractions, why substance *A* has a low melting point.
- Explain why substance *A* is a poor conductor of electricity, but substance *B* is a good conductor in the aqueous state.
- A substance that has a melting point of 1,074 K conducts electricity when dissolved in water, but does *not* conduct electricity in the solid phase. The substance is *most* likely
  - a metallic solid
  - an ionic solid
  - a molecular solid
  - a network solid
- Which compound is a poor conductor of heat and electricity and has a high melting point?
  - SiO<sub>2</sub>
  - CO<sub>2</sub>
  - N<sub>2</sub>O
  - H<sub>2</sub>O
- Which substance will conduct electricity in *both* the solid phase and the liquid phase?
  - HCl
  - H<sub>2</sub>
  - AgCl
  - Ag
- The ability to conduct electricity in the solid state is a characteristic of metallic bonding. This characteristic is *best* explained by the presence of
  - high electronegativities
  - mobile protons
  - high ionization energies
  - mobile electrons
- The electrical conductivity of KI(aq) is *greater* than the electrical conductivity of H<sub>2</sub>O because the KI(aq) contains mobile
  - ions from KI
  - molecules of H<sub>2</sub>O
  - ions from H<sub>2</sub>O
  - molecules of KI