

CH 301 Fall 2008 Worksheet 10: Intermolecular Forces

1. What is the major flaw with kinetic molecular theory that makes it unable to explain condensed matter?
2. Which of the following gases would deviate the least from the ideal gas equation. Which one would deviate the most? Explain your answers.



3. True and false time. Be able to explain your answer.
T F (a) Hydrogen bonds are sometimes stronger than covalent bonds.
T F (b) A dipole moment in a molecule is caused by a difference in electron density.
T F (c) An ion-ion interaction involves the sharing of electrons between nuclei.
T F (d) In a series of ionic compounds, the compound with the largest charge density in the ions will have the highest melting point.
T F (e) Hydrogen bonds can exist between a hydrogen atom and any other elements.
T F (f) London forces in a compound can be large enough to create solid materials at room temperature.
T F (g) Water rises in a capillary tube because of strong adhesive forces attracted to the glass walls.
T F (h) Instantaneous dipoles exist in ALL compounds.
4. Classify each of the following interactions as a covalent bond, ion-ion interaction, hydrogen bonding, permanent dipole, or London forces:
 - a. The interaction between potassium and bromine in KBr
 - b. The interaction responsible for water's surface tension
 - c. The attraction between two carbons in hydrocarbon
 - d. The interaction between one molecule of CH_3F to another molecule of CH_3F
 - e. The attraction of the electrons of an Ar atom to a CH_3F
5. If you spilled a few drops of ether on a lab bench, would you expect it to form beads of liquid on the surface, or spread out evenly? Why? What about water?
6. It takes longer to cool spaghetti at high altitude. Why?
7. For each of the solution properties, explain the relationship to increase intermolecular forces.
 - a. Viscosity
 - b. Capillary Action
 - c. Surface Tension
 - d. Vapor Pressure
 - e. Tendency of Evaporate

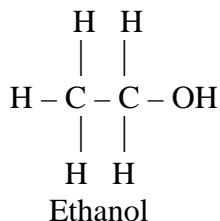
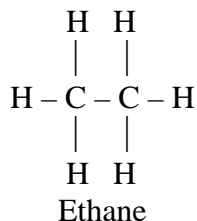
8. Predict the order of increasing capillary action for the following:



9. Put the following compounds in order from lowest boiling point to highest boiling point and justify your answer.



10. Why is ethane less viscous than ethanol?



11. Put the following compounds in order from the lowest melting point to the highest melting point:



12. For each solid classify its bonds as ionic, covalent, or metallic:

- KF
- CsI
- Ni
- C₆H₂
- H₂O