Practice #1 HOW WELL DO YOU UNDERSTAND INTERMOLECULAR FORCES?

When contemplating the following problems it often helps to draw a Lewis structure for the included molecules.

- 1. The dipole moments of acetonitrile, CH_3CN , and methyl iodide, CH_3I , are 3.9 D and 1.62 D, respectively.
 - A) Which of these substances will have the greater dipole-dipole attractions among its molecules?
 - B) Which of these substances will have the greater London dispersion attractions?
 - C) The boiling points of CH₃CN and CH₃I are 354.8 K and 315.6 K, respectively. Which substance has the greatest overall attractive forces?
- 2. Of Br_2 , Ne, HCl, HBr, and N_2 , which is likely to have
- A) the largest intermolecular dispersion forces?
- B) The largest dipole-dipole attractive forces?

3. In which of the following substances is hydrogen bonding most likely to play an important role in determining physical properties: methane (CH_4), hydrazine (H_2NNH_2), methyl fluoride (CH_3F), or hydrogen sulfide (H_2S)?

4. In which of the following substances is significant hydrogen bonding possible: methylene chloride (CH_2Cl_2), phosphine (PH_3), hydrogen peroxide (HOOH), or acetone (CH_3COCH_3)?

5. List the substances BaCl₂, H₂, CO, HF, and Ne in order of increasing boiling points.

6. A)Identify the intermolecular forces present in the following substances, and B) select the substance with the highest boiling point: CH₃CH₃, CH₃OH, CH₃CH₂OH