Skill Practice 25

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Which of the following molecules would you expect to have the strongest intermolecular forces—O2 or S2? Explain why.
2. Consider the following molecules, SO2 and CO2:



* 1. What kind of intermolecular force exists between each type of molecule?
  2. Which one would you expect to have the highest boiling point?
  3. Which one would you expect to have the lowest freezing point?
  4. Which one would you expect to be more soluble in water?
  5. If both were liquid at a certain temperature, which would you expect to have the greatest surface tension based on intermolecular forces?

1. Substance A boils at 78.5oC. Substance B boils at 64.2oC. Substance C boils at 87.9oC. Rank the three substances in order from strongest to weakest intermolecular forces.
2. Is it more difficult to liquefy (change from gas to liquid) polar molecules or nonpolar molecules? Explain why.
3. Liquid N2 boils at a lower temperature than liquid O2.
   1. What type of force exists between N2 molecules? Between O2 molecules?
   2. Which forces are stronger—those between N2 molecules or those between O2 molecules?
4. Substance X has a molar mass of 145 g/mol. Substance Y has a molar mass of 210 g/mol. Substance Z has a molar mass of 125 g/mol. Assuming that X, Y, and Z are all composed of only carbon and hydrogen, rank them in order from strongest to weakest intermolecular forces. And then name the force that exists between the molecules.