

1. List all of the intermolecular forces for each of the following compounds. (11 points)

CHF₃: London Dispersion forces + dipole-dipole

CH₃OH: London, dipole-dipole + hydrogen bonding

H₂: London Dispersion forces

NH₃: London Disp. forces, dipole-dipole + hydrogen bonding

2. Dimethyl ether, CH₃OCH₃, and ethanol, CH₃CH₂OH, are isomers. They have the same formula, but different structures. One has a boiling point of 78°C and the other boils at 25°C. Indicate the boiling point and the intermolecular forces for each of the compounds below. (8 points)

Dimethyl ether, CH₃OCH₃ :

boiling point = 25 °C

intermolecular forces : London forces + (weak) dipole-dipole forces

ethanol, CH₃CH₂OH:

boiling point = 78 °C

intermolecular forces : London forces, dipole-dipole + hydrogen bonding

3. Which of the following statements concerning hydrocarbons are correct?
Circle all correct choices. (8 points)

- a) Hydrocarbons are non-polar.
- b) Hydrocarbons have only London dispersion forces.
- c) Hydrocarbons exhibit hydrogen bonding.
- d) Hydrocarbons contain hydrogen, oxygen and carbon atoms.



4. A substance with stronger intermolecular forces will... (Circle all correct choices.) (8 pts)

a) have a higher vapor pressure.

b) have a higher viscosity.

c) have a higher boiling point.

d) have a lower melting point.

5. Place the following substances in order of increasing melting point. (5 points)

H₂O, NaCl, CO₂, O₂ and HCl

O₂ < CO₂ < HCl < H₂O << NaCl
lowest melting point → highest melting point