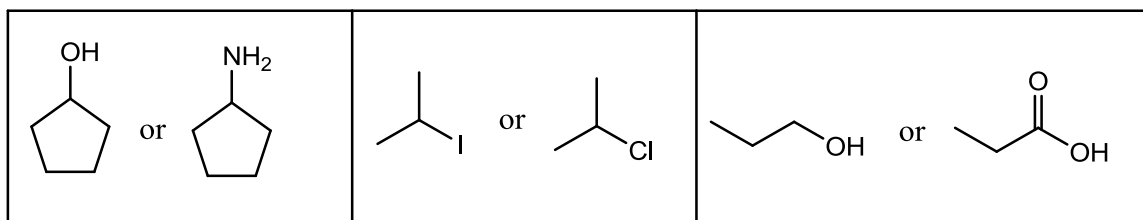


Intermolecular forces (IMFs), combined with an understanding of shape/geometry to help us understand the physical properties of molecules (eg. Polarity, Melting Points, Boiling points, Solubility, etc).

1. List the four major types of IMFs. Which are strongest? Weakest?

2. Explain how IMFs impact boiling points.

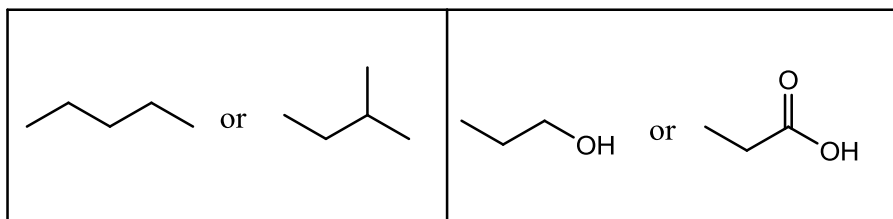
3. Which compound in each pair below would be expected to have the higher boiling point? Explain why.



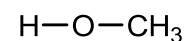
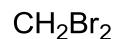
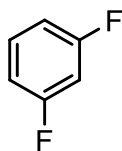
4. Explain how IMFs impact melting points.

5. What other factor affects melting points?

6. Which compound in each pair below would be expected to have the higher melting point? Explain why.



7. Even when molecules contain polar IMFs, there is no guarantee that the overall molecule will be polar. This is because the world is three-dimensional. With this in mind, give the overall dipole moment (if any) for each molecule below. This is often indicated with one large dipole arrow. You may want to re-draw the molecules to include all lone pairs and to better reflect the real geometry of the molecule before attempting this exercise.



8. BH_3 and NH_3 have similar formulas and might be expected to have similar properties. However, BH_3 has no observed dipole moment but NH_3 has a dipole moment of 1.47 D. Use your knowledge of structure and bonding to explain this difference. Draw pictures to help with the discussion.

9. Explain how IMFs impact solubility.

10. Match up the compounds on the left below with the solvent which would best dissolve it (on the right). Explain your choices.

Compound	Solvent
	H_2O
	CH_3OCH_3
	CH_3OH
NaCl	C_6H_6