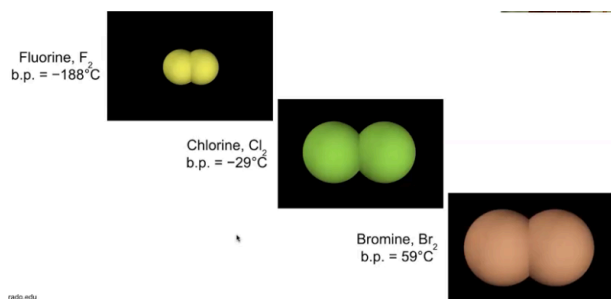


AP Chemistry Daily Videos

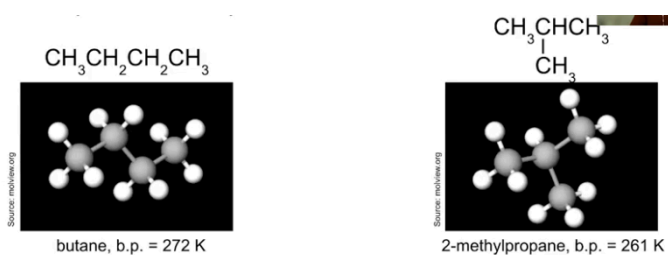
3.1 Intermolecular Forces

Daily Video #1

1. What is the difference between intramolecular forces and intermolecular forces?
2. How are intermolecular forces (IMFs) formed?
3. What are dipole-dipole interactions?
 - a. What determines the strength of dipole-dipole interactions?
4. What is an induced dipole?
5. What causes two nonpolar molecules to interact?
6. What determines the strength of the London dispersion forces (LDF)



7. How does the shape of the molecule determine the strength of the LDFs



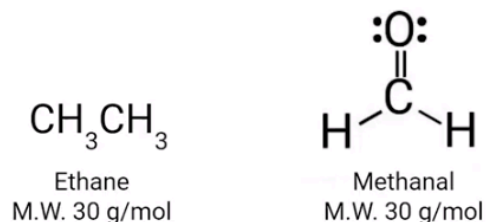
8. Pause the video at 6:14 and attempt the problem, then evaluate how you did and identify any errors.

The table below summarizes some physical properties of chlorine and hydrogen chloride - How can we use our understanding of intermolecular forces to account for the difference in enthalpy of vaporization?

Substance	$\Delta H_{\text{vaporization}}$ (kJ/mol)	Dipole Moment (D)
Cl_2	24.4	0
HCl	16.2	1.05

9. Pause the video at 7:10 and attempt the problem, then evaluate how you did and identify any errors.

The structures of ethane and methanal are shown below. One of these two molecules is a liquid at room temperature.



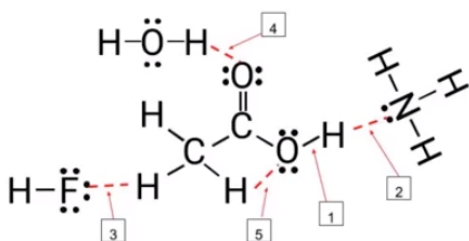
Based on their structure and intermolecular forces, predict the molecule which is a liquid at room temperature.

Daily Video #2

1. What are the characteristics of Hydrogen "bonding"

2. Which of the five interactions labeled are hydrogen bonding.

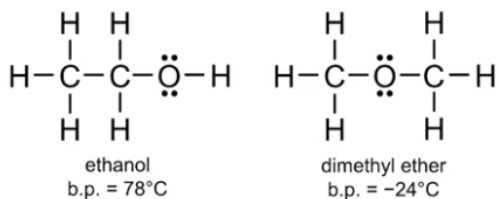
Is this hydrogen bonding?



3. What are ion-dipole interactions?

4. Pause the video at 6:45 and attempt the problem, then evaluate how you did and identify any errors.

Lewis diagrams and boiling points of the isomers ethanol and dimethyl ether are shown below.



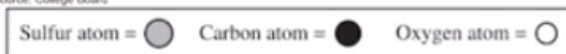
Explain the difference in the boiling points of the two substances using principles of molecular structure and intermolecular forces.



Daily Video #3

1. Which properties of a substance INCREASE when IMFs increase?
2. Which properties of a substance DECREASE when IMFs increase?
3. What do you have to consider to compare the IMFs of different substances?
4. Pause the video at 4:27 and attempt the problem, then evaluate how you did and identify any errors.

Check your understanding

Image source: College Board



Compound	Molecular Structure	Boiling Point at 1 atm (K)
CS ₂		319
COS		223

The table above give the molecular structure and boiling points of CS₂ and COS. In terms of types and relative strengths of intermolecular forces in each compound, explain why the boiling point of CS₂ is higher than that of COS