

10-30 IB Chem Kids explained HW - took all period
HW = make a VSEPR → Molecule Polarity chart

10-31

Intermolecular v. Intramolecular

↓
Between/among molecules
Responsible for melting pts &
boiling pts

↑
covalent bonding
(2) (1)

Responsible for bond enthalpy values

aka Energy/temp of phase changes
aka How much attraction
between molecules must
be overcome to separate
them from one another?

Something you know
interpersonal
between/among
interstate highway
from one state to another /
"across states"

intra personal
within

Main 3 Types of IMFs (= Intermolecular forces) text p. 124

Relative strength
increases
↓

- London forces (aka dispersion forces or instantaneous induced dipole-induced dipole forces)
- Dipole-dipole forces
- Hydrogen bonding

Text p. 125 pictures of instantaneous induced dipoles

Any nonpolar molecule possesses London forces

Halogens -- varying degrees of London forces can produce strong effects.

Polarizability accounts for varying strength of London forces.

3 factors:

- # of electrons (usually directly related to molar mass)
 - size (volume) of the electron cloud → further away = less attraction to nucleus
 - shape of molecules
- text p. 127 Fig 6

London forces are the only forces that affect noble gases & non-polar molecules; however, the reverse statement would be false.

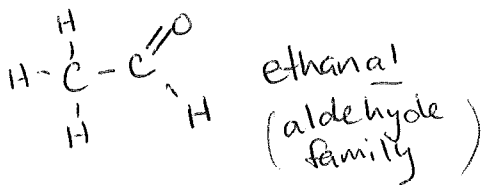
Noble gases & non-polar molecules are NOT the only chemical species affected by London forces. In fact, they affect EVERY MOLECULE, or atom.

~~Next~~ "strongest" force

Dipole-dipole forces

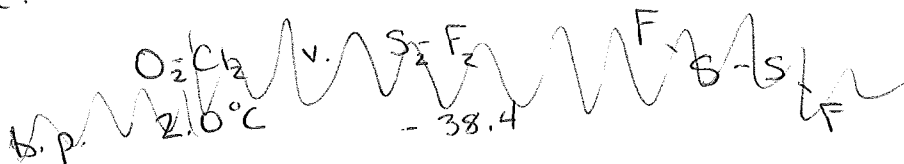
Text pgs 128-129 pictures (Fig 7 + Table 4)

CH₃CHO

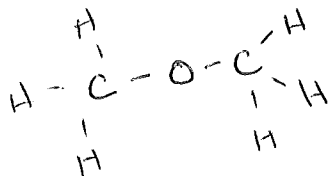


bp 20.2°C Pub Chem

This is where molecular polarity plays a central role.



methoxymethane
dimethyl ether



bp +8°C
-24.8°C
-23.6°C

Pub Chem

B.P.'s of Substituted methane compounds

10-31 cont'd

Halogen	1 halogen	2 halogens	3 halogens	4 halogens
CH ₄ -161.5°C	CH ₃ F -78.4°C	CH ₂ F ₂ -52°C	CHF ₃ -82.1°C	CF ₄ -127.8°C
	CH ₃ Cl -24.2°C	CH ₂ Cl ₂ 39.6°C	CHCl ₃ (= chloroform) 61.2°C	CCl ₄ 76.7°C

Avogadro tomorrow → tie in

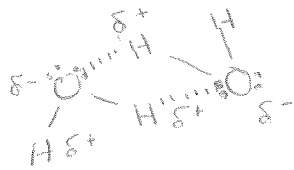
All of above = van der Waals forces (+ hybrids of above)

Hydrogen bonding = strongest IMF

◦ Requires H — N H — O H — F 2nd period nonmetal + H
"FON home"

◦ $\begin{matrix} H \\ | \\ H - C - F \\ | \\ F \end{matrix}$ No H-bonds! H — F etc must be directly bonded

◦ H-bond ≠ the covalent bond but rather



H δ⁺ is left exposed b/c more EN atom pulls electron cloud more strongly & period 2 its own e⁻ cloud doesn't ~~overwhelm~~ override the partial + charge.

Read text pgs 129-132

Fri = last day on Topic 4

but exam will be wed. of next week

IA Days

- Wed's til 5pm
- Sat Nov 11th 9-3
- Sat, Nov 18th 9-3

IA Substantially Completed
Drafts Due Mon,
(On Time) Nov 27th