

INTERMOLECULAR FORCES

non-covalent, non-ionic attractions between molecules

(or within macromolecules)

determine such properties as:

phase(solid, liquid or gas)

boiling point

vapor pressure

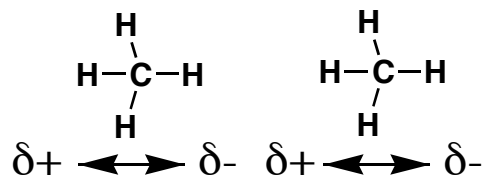
solubility

(three-dimensional structure of macromolecules)

All Molecules **London Forces (dispersion forces)**

- **instantaneous, temporary dipole**
from unsymmetrical electron distribution

- temporary dipole on one molecule
induces a temporary dipole
on neighboring molecules

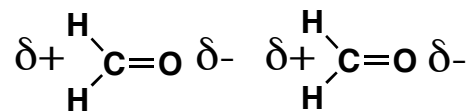


- strength of attraction depends on molecule's **polarizability**

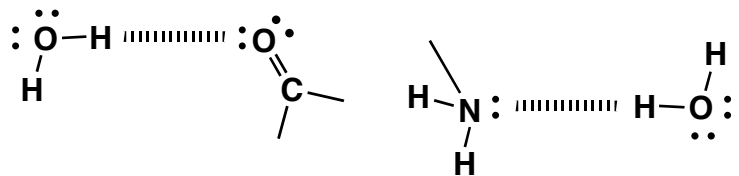
- polarizability increases with number of electrons,
therefore **strength of attraction is proportional to MW**

Polar Molecules **dipole-dipole attraction**

- partial positive and partial negative areas attract
- intermediate strength of attraction



Hydrogen Bonding



- **strongest of the attractions**

- **hydrogen bonded to nitrogen or oxygen**,
attracted to **lone pair of electrons** on **nitrogen** or **oxygen**