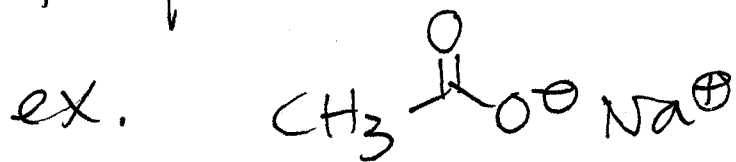


Functional groups affect physical properties + molecular structure.

physical properties such as mp + bp are affected by intermolecular forces - functional groups have a lot to do with these.

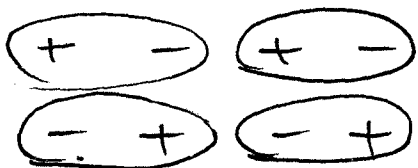
1. Ion-ion forces - e'static attraction between oppositely charged ions. v. strong - v. high mp + bp.



mp 324°C

bp unknown -
decomposes 1st!

2. Dipole-dipole forces. molecules w/ permanent dipoles (polar molecules) align w/ each other.



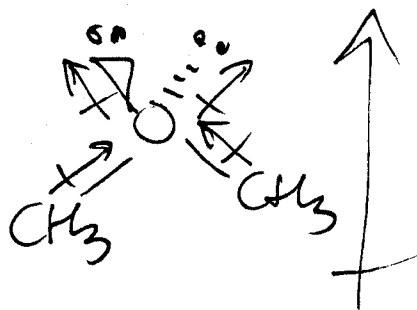
fairly strong.

* Hydrogen bonding - a specific instance of dipole-dipole forces - attractions between:

- ① an e⁻neg atom (O, N)
- ② a H attached to an e⁻neg atom (O, N)

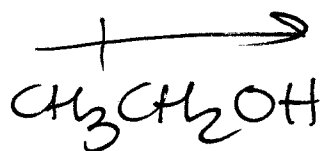
STRONG

CH3-O-CH3
dimethyl ether



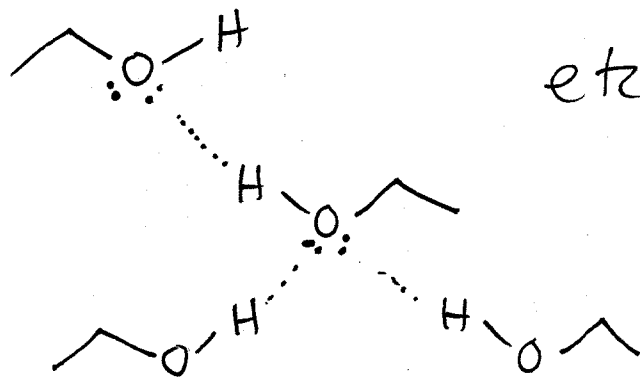
dipole-dipole

b.p. -24.9°C



ethanol

* can H-bond.



b.p. $+78.5^{\circ}$

both are polar

3. Van der Waals forces (London forces;
dispersion forces)

induced dipoles

* very weak - this is all that holds
nonpolar molecules
together.

solubilities - Like Dissolves Like.

polar compounds dissolve in polar solvents
nonpolar " " " nonpolar "

* large molecules are less soluble because
the hydrophobic R groups get big +
overwhelm any hydrophilic funct. grps.

Infrared (IR) Spectroscopy - used to
identify ~~power~~ presence / absence of
functional groups.