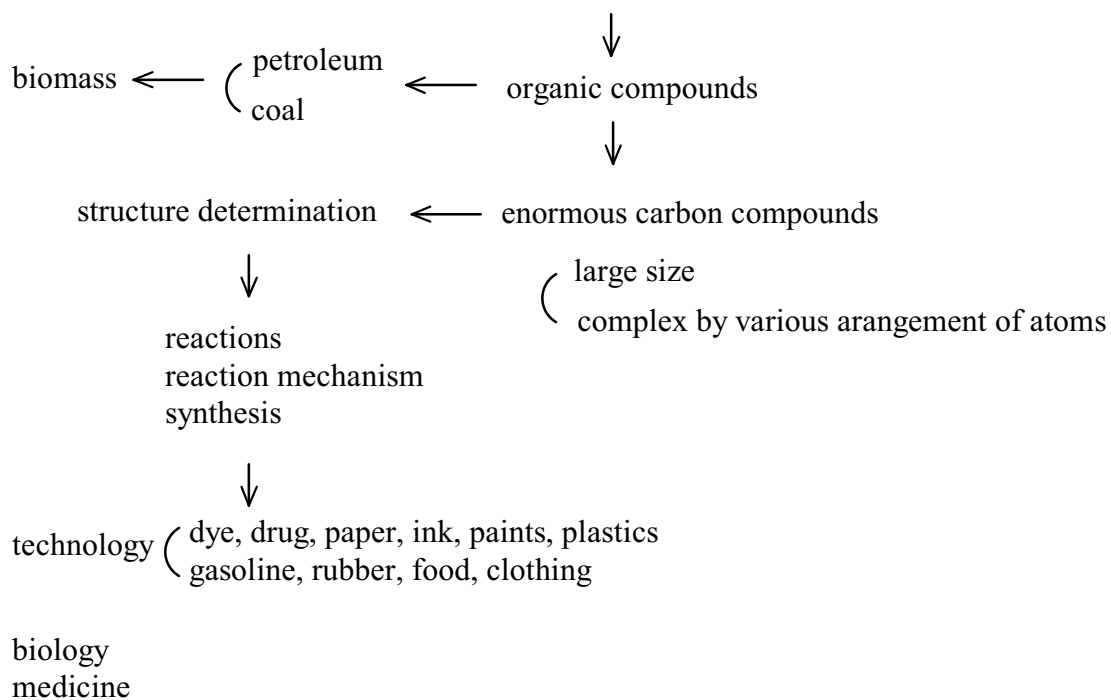
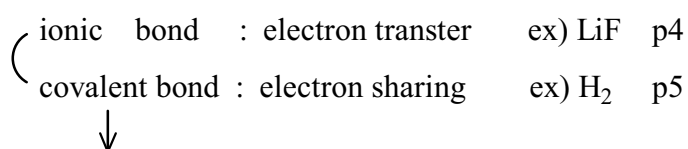


Chapter 1

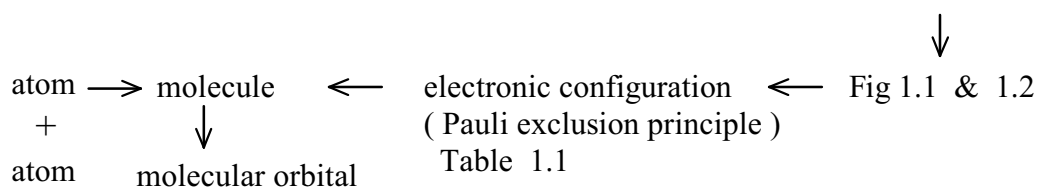
organic chemistry : chemistry of carbon compounds



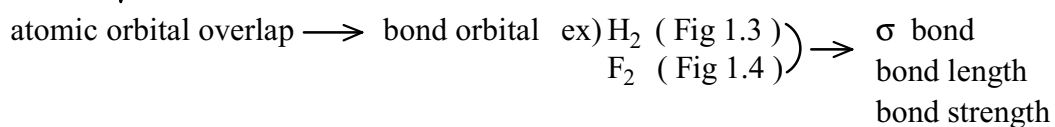
structural theory

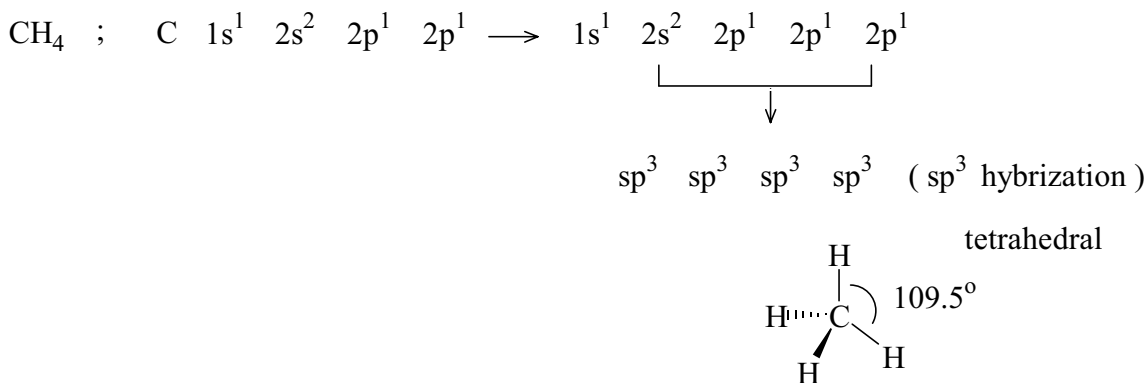
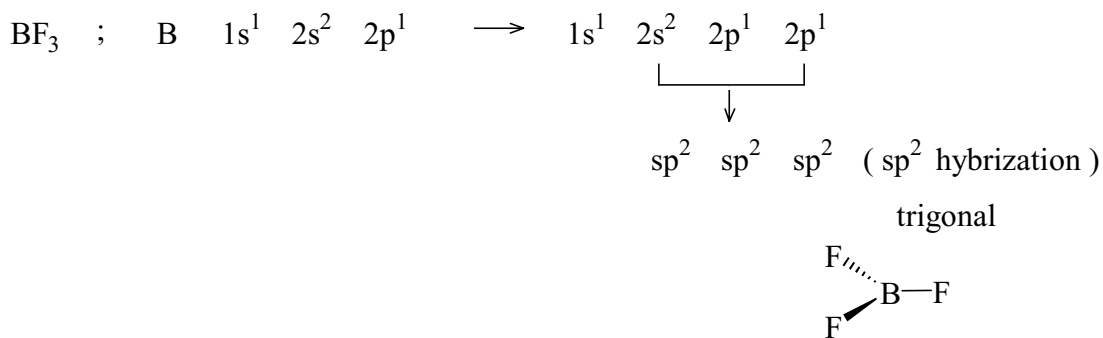
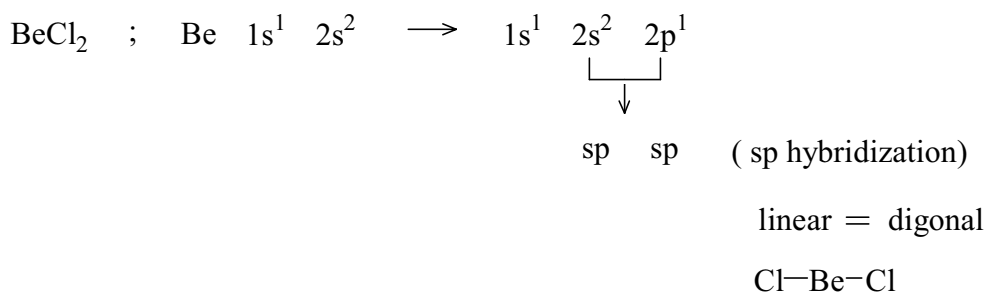
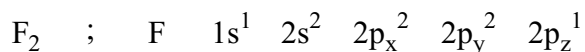
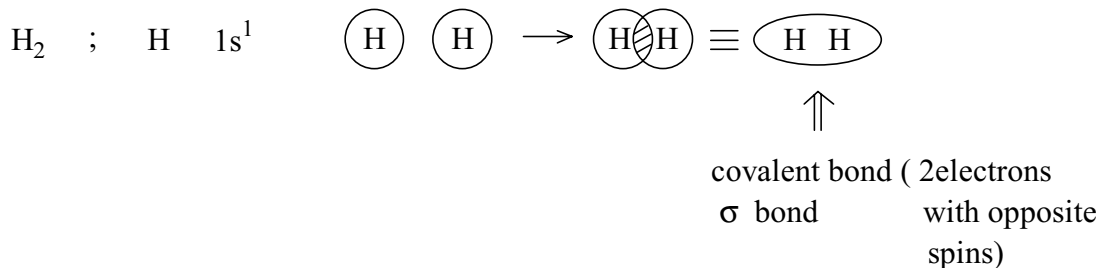


quantum mechanics \longrightarrow atomic orbital : probability, electron density

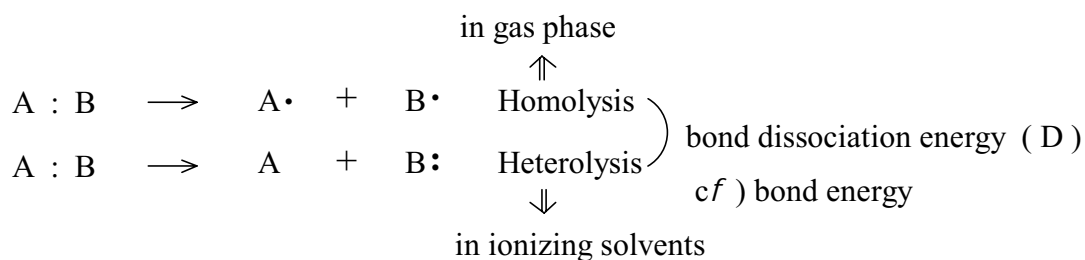
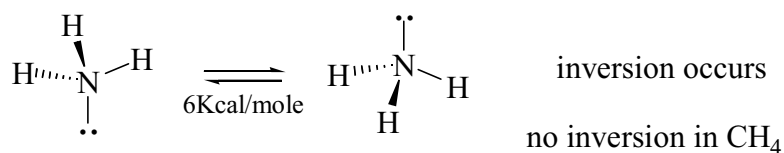


for simplicity, localized molecular orbital (bond orbital) is used.





NH₃, H₂O ; sp³ hybridization



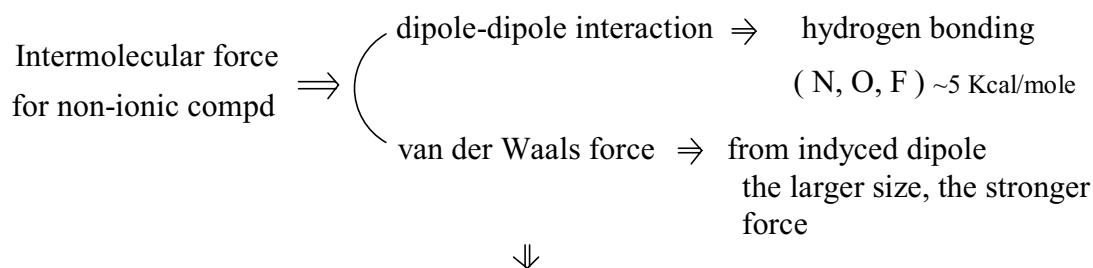
Certain covalent bonds have polarity ⇒ dipole (moment)

due to electronegativity

CH₄, CCl₄ ; μ = 0

NH₃ ; μ = 1.46 D

NF₃ ; μ = 0.24 D



m.p. & b.p. depend on them

For dissolution, energy is required to break intermolecular forces

↓

it is supplied by the bond formation between solute and solvent molecules

CCl₄, CH₄ (nonpolar) ⇒ not soluble in H₂O

CH₃OH (polar) ⇒ soluble in H₂O

R-OH ⇒ solubility in H₂O depends on R

↑↑ ↑↑

nonpolar polar

hydrophobic hydrophilic

lipophilic

ionic compds dissolved in a polar solvent

⇓

cation - neagtive end of the solvent molecule)
anion - positive end of the solvent molecule) ⇒ ion - dipole attraction

⇓

solvated (hydrated) ⇐ aggregates supply enough energy ⇐ weaker than interionic bond

Lowry-Brrønsted & Lewis ⇒ electronegativity
↓ ↓ size charge
oxonium ion complex
(p34) (p34)

H-CH₃ < H-NH₂ < H-OH < H-F
H-SH < H-Cl
H-F < H-Cl < H-Br < H-I
H-OH < H-SH < H-SeH

Isomerism