II. **Inter**molecular Forces and Chemical Properties (of organic compounds)

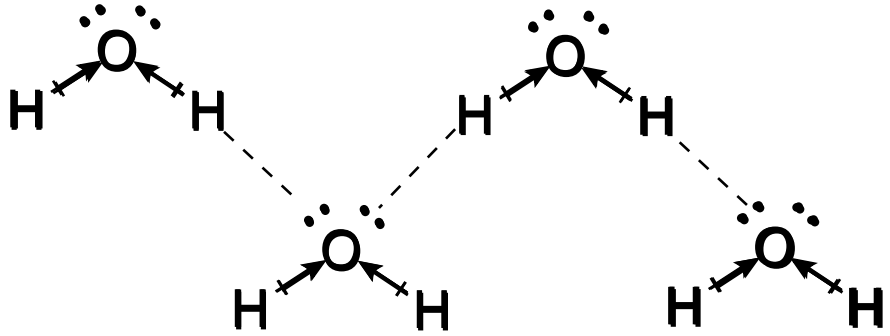
A. dipole-dipole

1. Ionic (very strong)

$Na^+ Cl^- Na^+ Cl^- Na^+ Cl^- Na^+ Cl^-$
$Cl^- Na^+Cl^- Na^+Cl^- Na^+Cl^- Na^+$
$Na^+ Cl^- Na^+ Cl^- Na^+ Cl^- Na^+ Cl^-$
$Cl^- Na^+Cl^- Na^+Cl^- Na^+Cl^- Na^+$

2. Hydrogen bonding (strong)

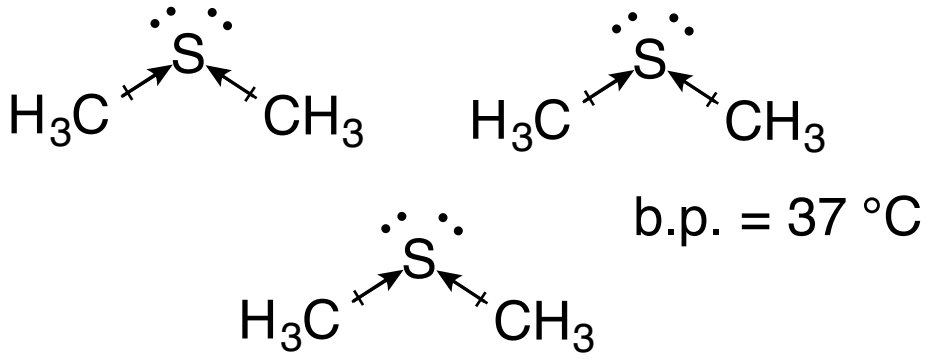
H bridges two atoms (F, O, N, S) using
a covalent bond and
an electrostatic bond

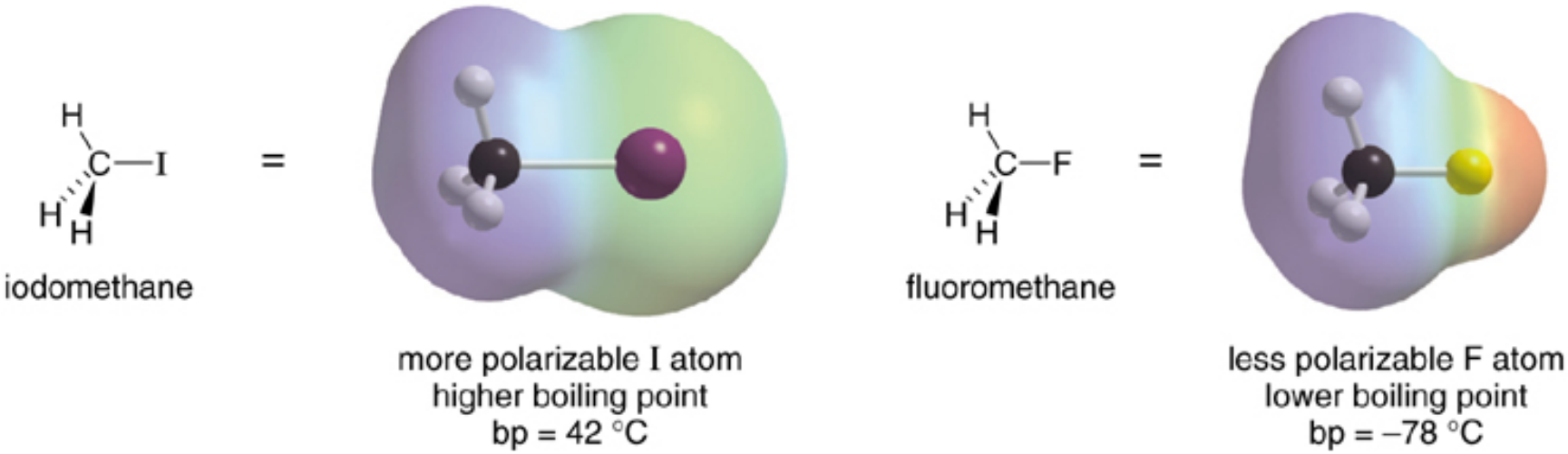


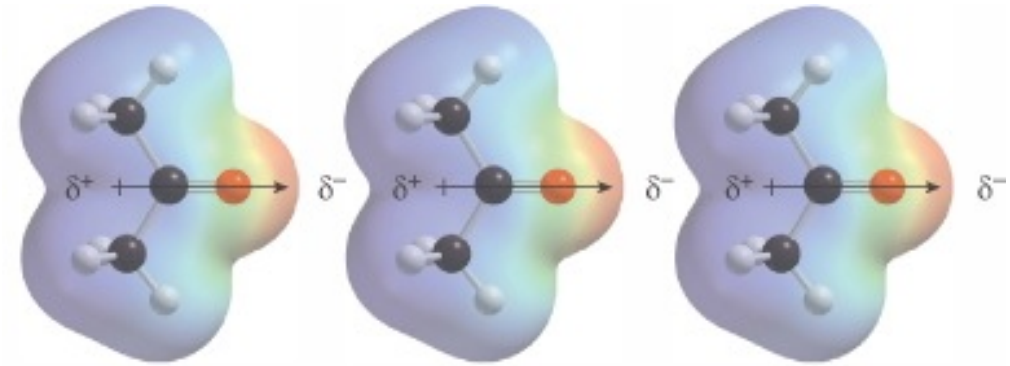
R–O–H - - - - - - F–C

C–H - - X - - - F–C

3. dipole-dipole (moderate)

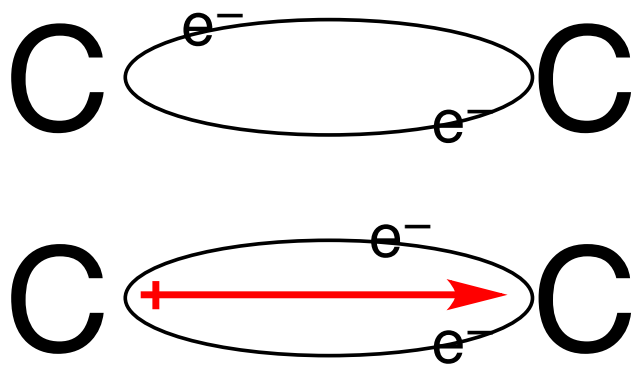


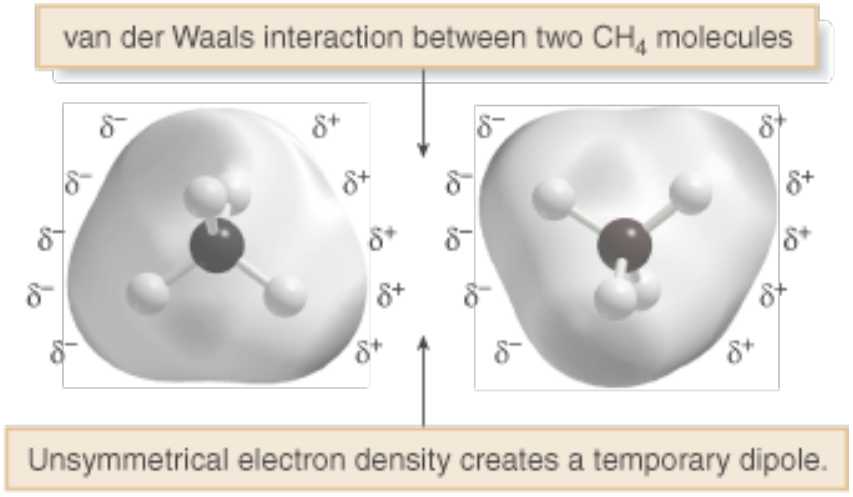


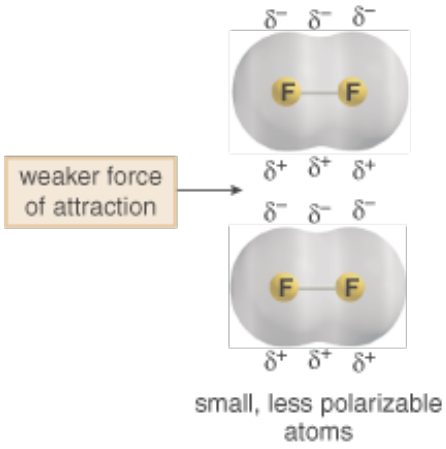


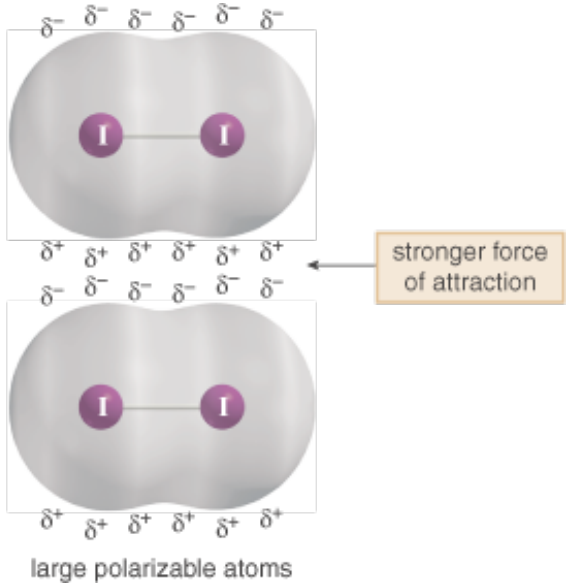
4. van der Waals (weak, but still significant)

Sometimes called London Forces
An induced dipole
Surface area of the molecule is important









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Pentane isomers (C_5H_{12})