

Intermolecular Forces (IMF)

IMFs: forces of attraction or repulsion which act between neighboring particles (atoms, molecules or ions)

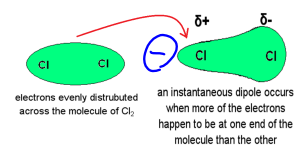
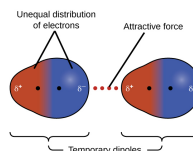
4 Types:

- london dispersion
- dipole-dipole
- hydrogen bonding
- ionic

London Dispersion

- weakest of the three
- has a temporary dipole
- all molecules have dispersion force

+
✓

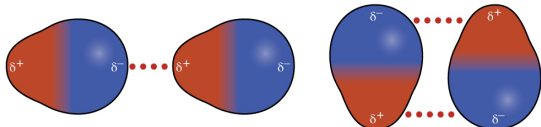


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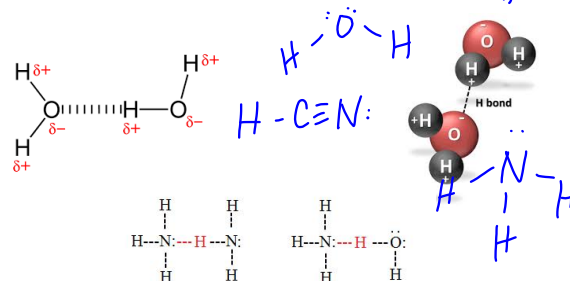
Dipole - Dipole

- stronger than london dispersion forces
- molecules have a permanent dipole
- POLAR molecules have dipole-dipole IMF



Hydrogen Bonding

- stronger than dipole-dipole and london dispersion
- molecules that have H directly bonded to N, O or F

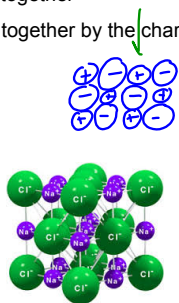
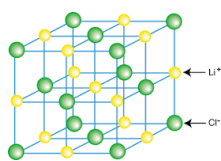


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Ionic Bonding

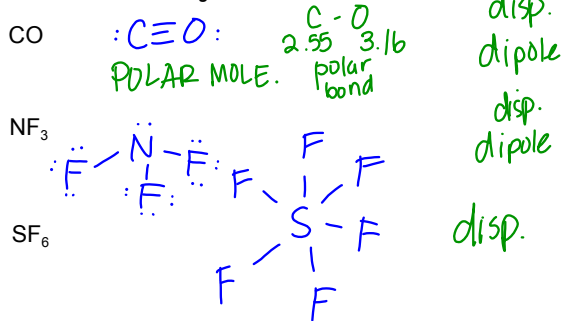
- strongest of the IMF's
- metal and a nonmetal are bonded together
- electrons are transferred and held together by the charges
- form a crystal lattice structure



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EXAMPLES:

Determine the IMF acting on the molecules below:



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Melting Point and Boiling Point

Order of increasing boiling point:

London dispersion, dipole -- dipole, H-bonding, ionic bonding

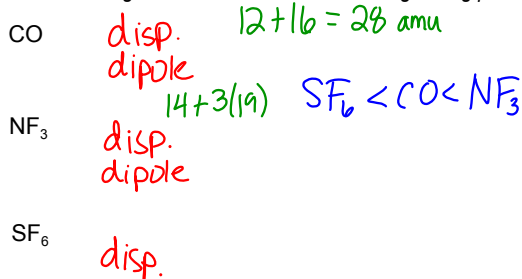
If 2 substances have the same IMF, then you use mass to determine which has a higher MP or BP.

greater the mass, the greater the m.p.:b.p.

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EXAMPLES:

Put the following molecules in order of increasing boiling point:



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