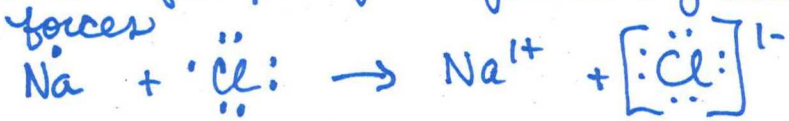
Ionic -vs- Covalent Bonding

Chemical Bond - force holding atoms together in a combined state.
- maybe a result of opposite charges (ionic bond), magnetic attraction or electrical attractions - or a combination of the above

Ionic Compounds

- m + nm
- attraction of opposite charges
  - no "sharing of electrons"
- ionic compounds consist of electrically neutral groups of ions joined by electrostatic forces



m + nm → salt
m + oxygen → metallic oxide

- almost always exothermic
- during the formation of an I.C. the ions are packed into a regular repeating pattern
  - form 3-D crystalline lattice
- ionic bonds are relatively strong bonds
- MP, BP - high
- hardness & physical characteristics depend on how strongly the particles are attracted to each other
- in solid form - ionic compounds do NOT conduct electricity
  - in liquid state or dissolve in H_2O they conduct electricity (due to dissociation of "free" ions)
- solids at room temperature

Covalent Compounds

- nm + nm
- share electrons
  - each e^- in a shared pair is attracted to nuclei of each atom

Molecule - when 2 or more atoms are bonded covalently

- 7 Diatomic molecules - BrINClHOF
- strength of a covalent bond depends on the distance between the bonded nuclei
- endothermic reactions
- do not conduct electricity
- low mp, low BP
- gases at room temperature

2 Types of Covalent Bonds

Polar Covalent (ex: H_2O) - unequal sharing of electrons
  - atoms take on a sl. charge

Nonpolar Covalent - equal sharing of e^-
BrINClHOF, CH_4,