



Combining Elements

Atoms Need To Fill Their Outer Shells

1. **Mixture** – 2 or more elements combined but *not chemically* no new substance formed “cereal & milk or oil & water”
2. **Solution** – a mixture that is uniform or even throughout *homogenous* (solute dissolves into solvent) “salt & water”
3. **Compound** – 2 or more elements *chemically* combined a new substance is formed “hydrogen gas & oxygen gas make water”
4. **Molecule** – smallest part of a compound, 2 or more atoms bonded
molecular formulas - a way of representing molecules using symbols of the elements and subscripts

Rules For Writing Chemical Formulas

- A) a symbol stands for one atom of the element
“CaO has 1 atom of calcium and 1 atom of oxygen”
 - B) subscript - number written after and below the symbol tells number of atoms (no subscript means 1 atom)
“MgCl₂ has 1 atom of magnesium and 2 chlorine”
 - C) subscript after parentheses, each element multiplied by subscript (use the distributive property from math)
“Pb(NO₃)₂ has 1 lead atom, 2 nitrogen and 6 oxygen”
5. **Chemical Bond** – a force that holds atoms together in a molecule
 6. **Octet Rule** – atoms become stable by filling outer energy level
“most need 8 *valence electrons* (electrons in the outer shell)”
 - *Atoms may *give up or take* electrons (ionic bond)
 - *Atoms may *share* electrons (covalent bond)