Chemical Bonding

When 2 or more atoms come together and join by rearranging their valence electrons.

-Bonding can be shown using Lewis Dot Diagrams.

EX: C = 4 valence electrons

EX: Li, Be, Al, Si, Cl;

Ionic Bonds - ions between atoms with a high electronegativity difference.

EX: Na⁺, Cl⁻
EX-1

Na\textsuperscript{+} atom - wants to lose 1\textsuperscript{–} \\
\text{lost 1}\textsuperscript{–} \\
Na\textsuperscript{+} ion \\
ions attract \\
[Na\textsuperscript{+}][\text{Cl}^-] \text{ionic bond formed}

EX-2

Li\textsuperscript{+} atom - 2\textsuperscript{–} atom \\
\text{gains 2}\textsuperscript{–} \\
Li\textsuperscript{+} ion \\
ions attract
2. Covalent Bonds - between atoms with small differences in electronegativity (non-metals)

EX: $\text{H}_2\text{O}$

- $\text{H} = 1 \times 2 = 2$
- $\text{O} = 6 \times 1 = 6$
- 8 valence $\text{O}$

1. Count total # of valence $\text{O}$
2. Arrange atoms symmetrically, out numbered atom in middle
3. Put 2- between each atom
4. The remaining $\text{O}$ go to ch. more
Lewis Dot Diagram

structural formula $H_2O_2H$

EX-2 $NH_3 = 8$ valence

EX-3 $CCl_4 = 4 + 7 \times 4 = 32$

$Cl \quad Cl \quad Cl \quad Cl$

If they're not happy → double or triple up
EX-4 \[ \text{CO}_2 \]
\[
\begin{align*}
4 + 6 + 2 &= 12 \\
\text{O} = \text{C} = \text{O} \\
\end{align*}
\]

EX-5 \[ \text{CO} \]
\[
\begin{align*}
4 + 6 &= 10 \\
\text{C} = \text{O} \\
\end{align*}
\]

EX-6 \[ \text{SO}_4 \]
\[
\begin{align*}
6 + 6 \times 4 + 2 &= 32 \\
10 - 5 - 10 &= 2 \\
\end{align*}
\]