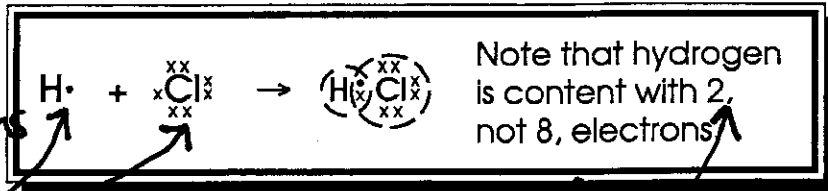


COVALENT BONDING

Name KEY

Covalent bonding occurs when two or more nonmetals share electrons, attempting to attain a stable octet of electrons at least part of the time. For example:

use 2 different symbols for valence electrons to show "sharing".



Show how covalent bonding occurs in each of the following pairs of atoms. Atoms may share one, two or three pairs of electrons.

<p>1. $\text{H} + \text{H} (\text{H}_2)$ ← product 1A 1A</p> <p>$\text{H}\cdot + \cdot\text{H} \rightarrow \text{H}(\overset{\times}{\underset{\times}{\text{H}}})$</p> <p style="text-align: center;">2e 2e</p> <p style="text-align: right;">full orbitals + sharing</p>
<p>2. $\text{F} + \text{F} (\text{F}_2)$ 7A 7A</p> <p>$\cdot\ddot{\text{F}}\cdot + \cdot\overset{\text{xx}}{\underset{\text{xx}}{\text{F}}}\cdot \rightarrow \text{F}(\overset{\text{xx}}{\underset{\text{xx}}{\text{F}}})$</p> <p style="text-align: center;">8e 8e</p> <p style="text-align: right;">full orbitals due to sharing (sharing 1 pair)</p>
<p>3. $\text{O} + \text{O} (\text{O}_2)$ 6A 6A</p> <p>$\cdot\ddot{\text{O}}\cdot + \cdot\overset{\times}{\underset{\times}{\text{O}}}\cdot \rightarrow \text{O}(\overset{\times}{\underset{\times}{\text{O}}})$</p> <p style="text-align: center;">8e 8e</p> <p style="text-align: right;">sharing 2 pair of electrons</p>
<p>4. $\text{N} + \text{N} (\text{N}_2)$ 5A 5A</p> <p>$\cdot\text{N}\cdot + \cdot\overset{\times}{\underset{\times}{\text{N}}}\cdot \rightarrow \text{N}(\overset{\times}{\underset{\times}{\text{N}}})$</p> <p style="text-align: center;">8e 8e</p> <p style="text-align: right;">sharing 3 pairs</p>
<p>5. $\text{C} + \text{O}_2 (\text{CO}_2)$ 4A 6A</p> <p>Carbon must share w/ both oxygen - put in middle</p> <p>$\cdot\overset{\times}{\underset{\times}{\text{O}}}\cdot + \cdot\text{C}\cdot + \cdot\overset{\times}{\underset{\times}{\text{O}}}\cdot \rightarrow \text{O}(\overset{\times}{\underset{\times}{\text{C}}})\text{O}$</p> <p style="text-align: center;">8e 8e 8e</p> <p style="text-align: right;">Need 3 circles - one for each atom</p>
<p>6. $\text{H} + \text{O} (\text{H}_2\text{O})$ 1A 6A</p> <p>$\text{H}\cdot + \cdot\overset{\text{xx}}{\underset{\text{xx}}{\text{O}}}\cdot + \cdot\text{H} \rightarrow \text{H}(\overset{\times}{\underset{\times}{\text{O}}})\text{H}$</p> <p style="text-align: center;">2e 8e 2e</p> <p style="text-align: right;">all orbitals full O=8e H=2e</p>