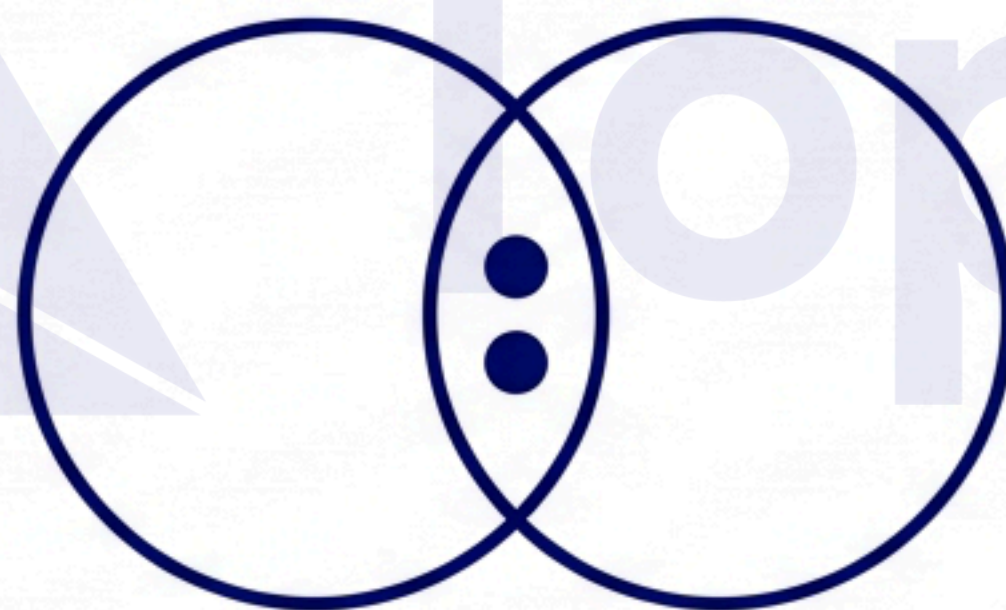


[CHEMISTRY 4.1.2]

Covalent Bond

The Mechanics of Electron Sharing

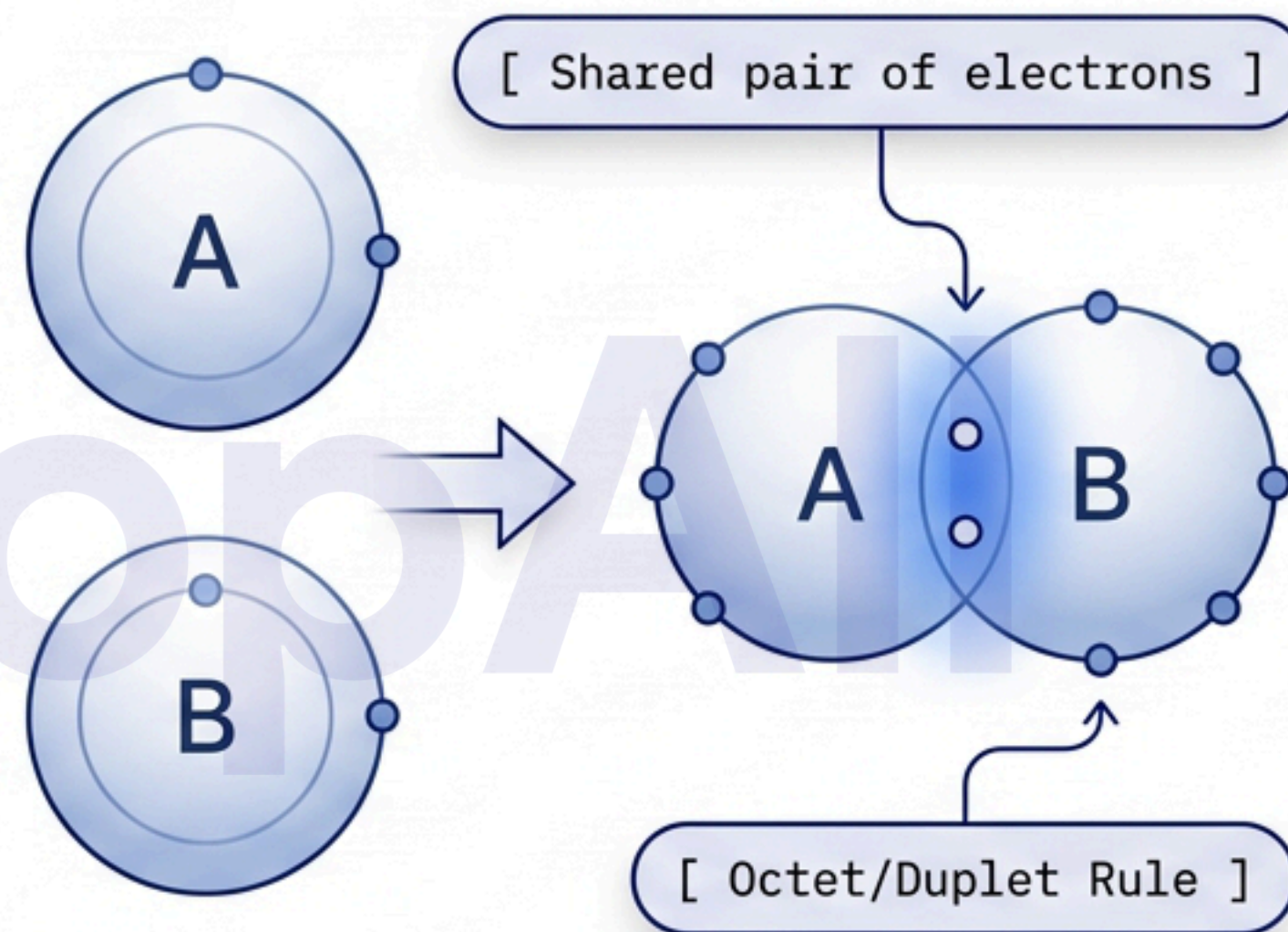


Based on the Lewis-Langmuir Theory

What Is a Covalent Bond?

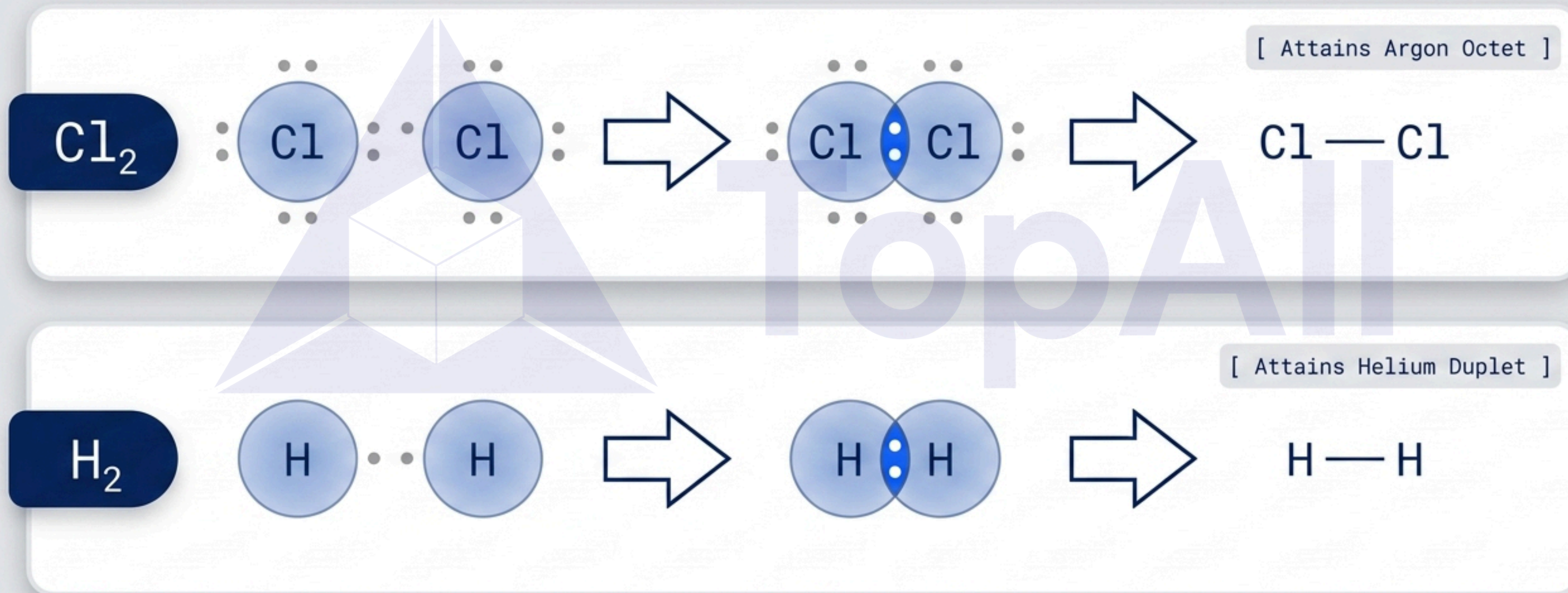
A bond formed when two atoms share a pair of electrons, with each combining atom contributing at least one electron to the shared pair.

By sharing, atoms attain a stable outer-shell noble gas configuration.



Single Bond

1 Shared Pair = 1 Line





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$$E=mc^2$$



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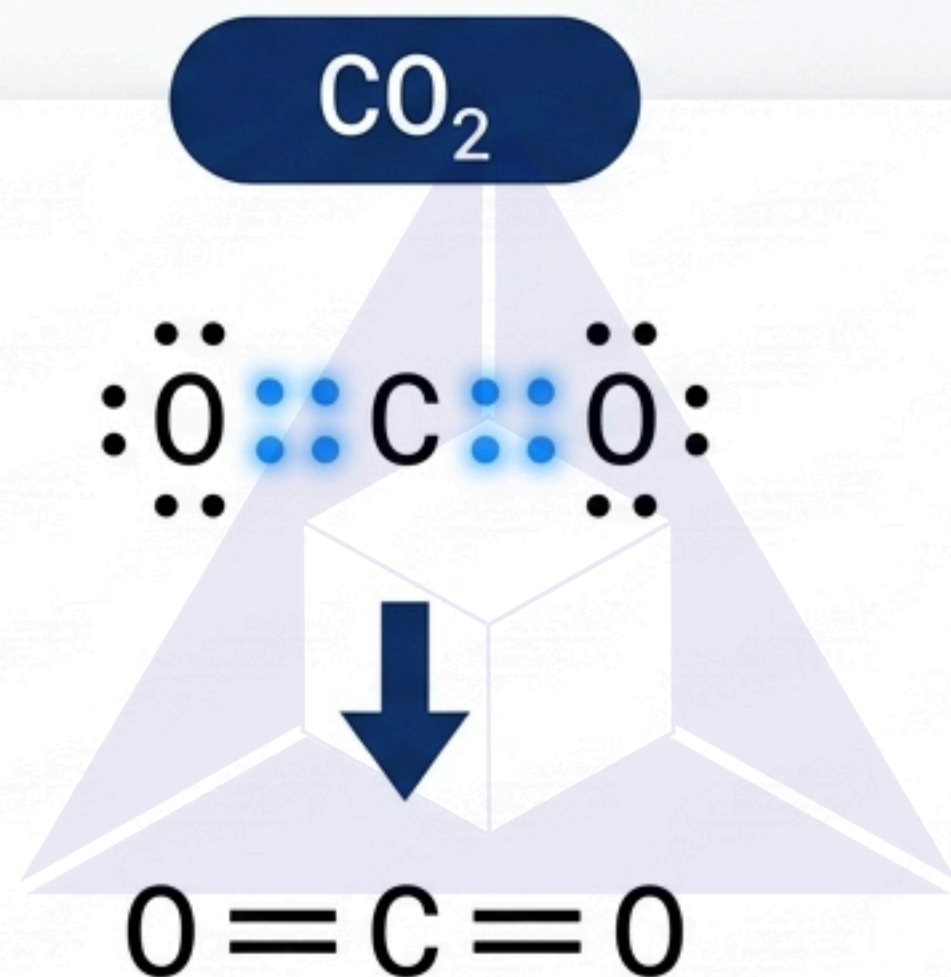
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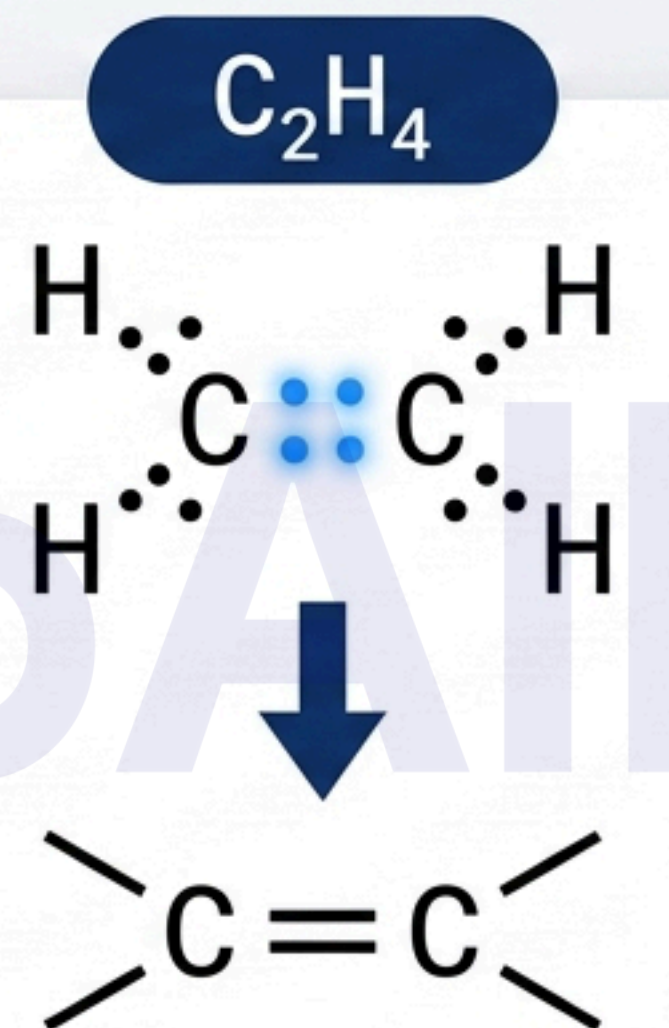
Double Bond

2 Shared Pairs = 2 Lines



[2 Pairs per bond]

[4 Electrons Total shared per bond]

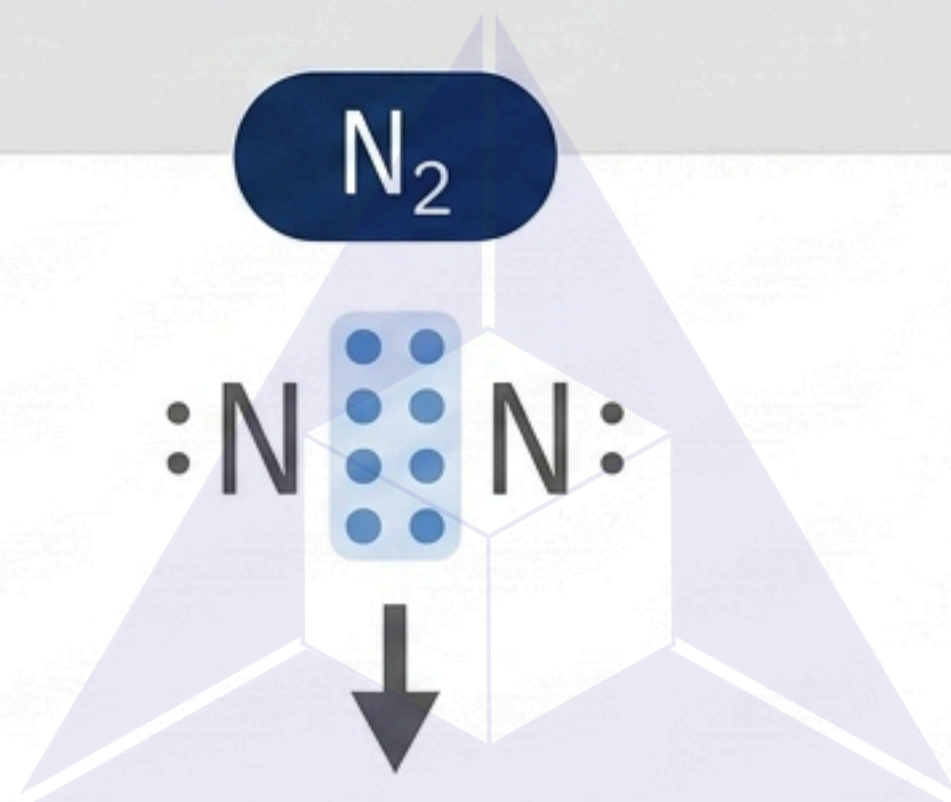


[2 Pairs per bond]

[4 Electrons Total shared per bond]

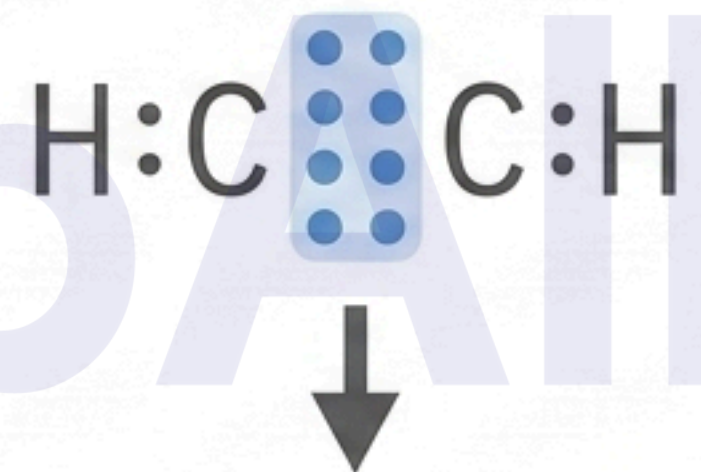
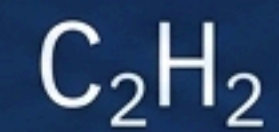
Triple Bond

3 Shared Pairs = 3 Lines



[3 Pairs]

[6 Electrons Total shared]



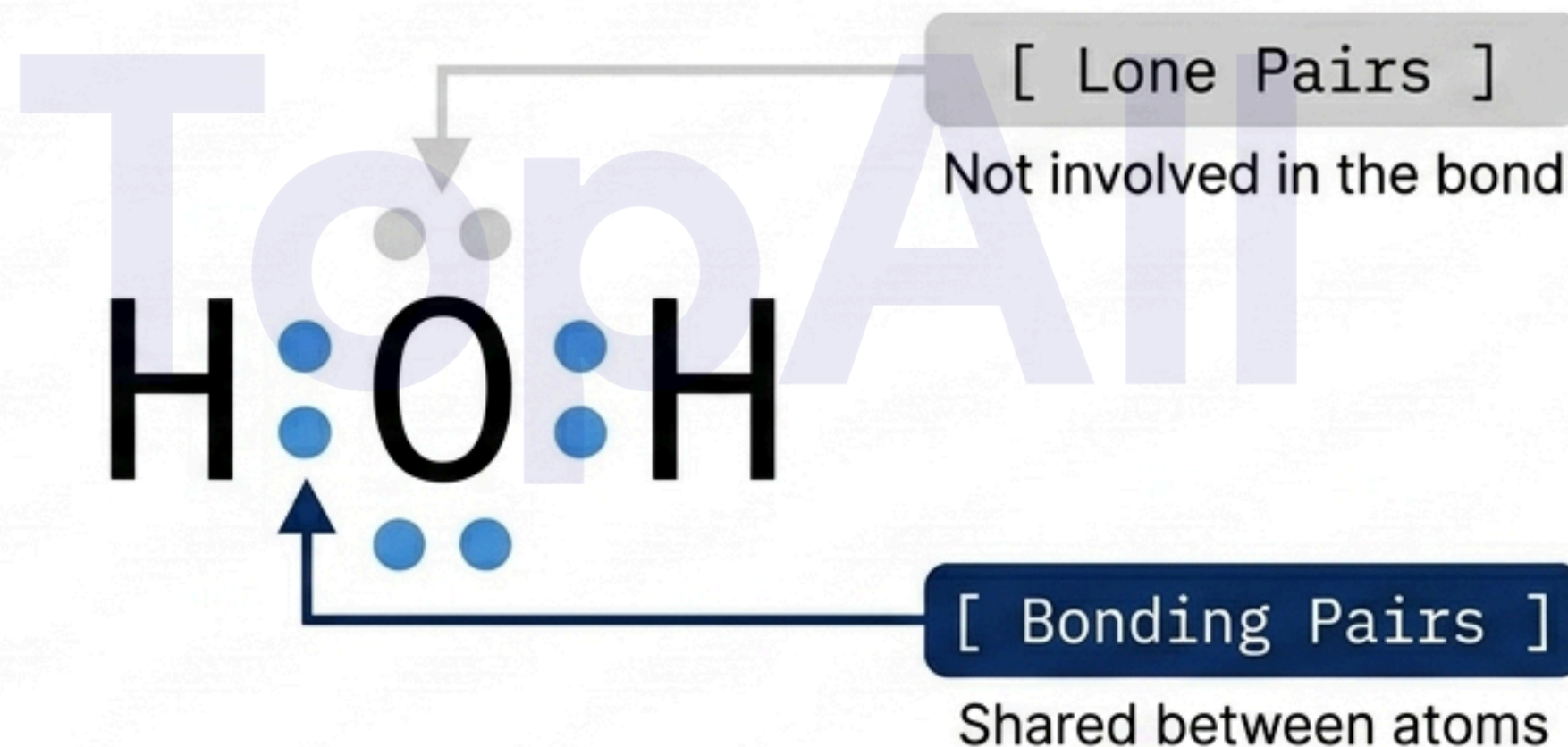
[3 Pairs]

[6 Electrons Total shared]

Lewis Dot Structures

The Framework of Bonding

1. Add total valence electrons from all combining atoms.
2. Distribute as shared pairs (bonds) between atoms.
3. Use remaining electrons to complete octets (as lone pairs or multiple bonds).



Covalent Bonds Recap

Synthesis Matrix

Bond Type	Electron Pairs Shared	Total Electrons Shared	Visual Representation	Key Examples
Single	1 Pair	2 Electrons	—	Cl ₂ H ₂
Double	2 Pairs	4 Electrons	=	CO ₂ C ₂ H ₄
Triple	3 Pairs	6 Electrons	≡	N ₂ C ₂ H ₂

"Every system tends to lower its energy to attain stability."



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