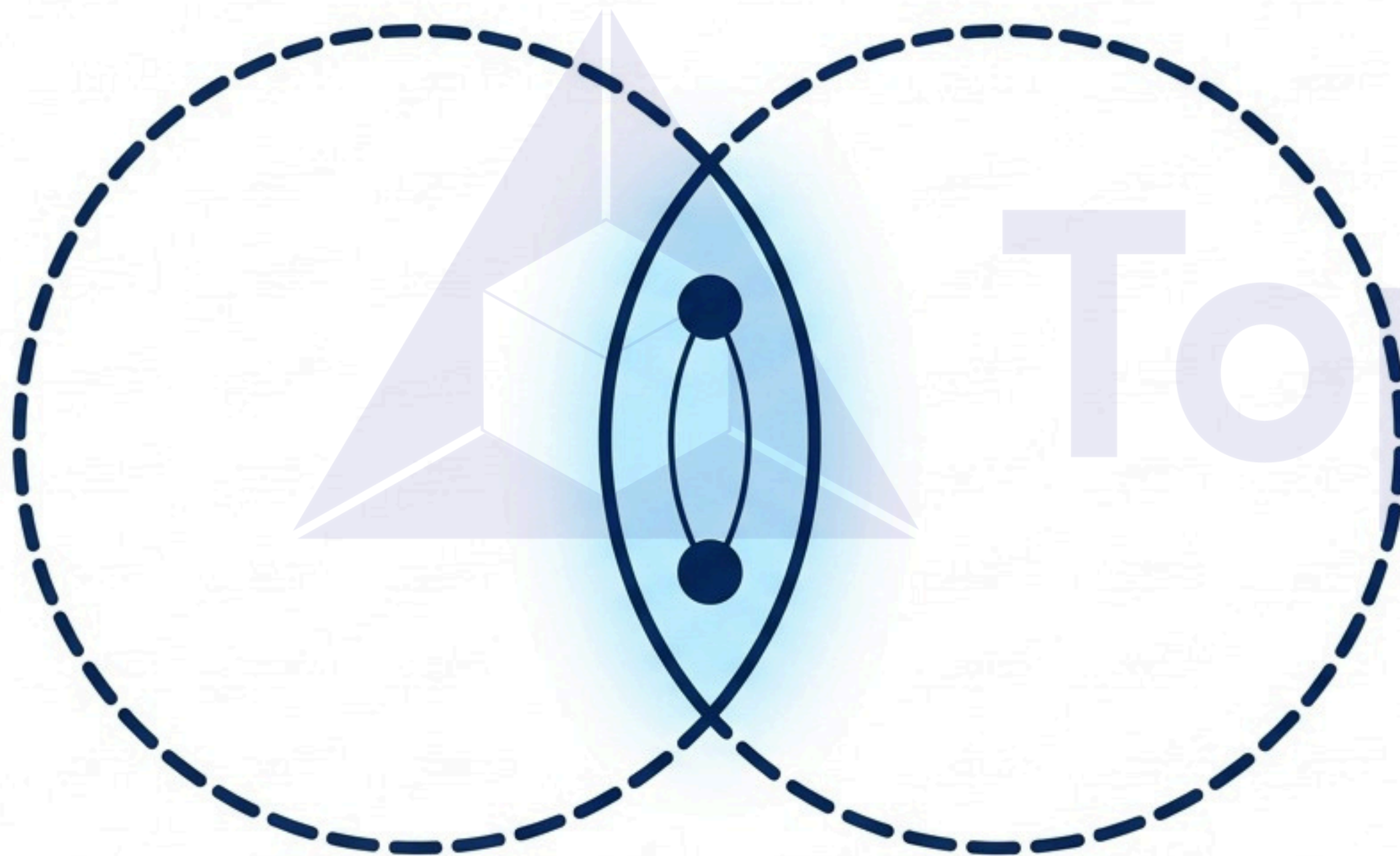


The Architecture of Sharing

How atoms achieve stability without losing electrons.



The Langmuir Refinement (1919)

While earlier theories focused on the complete transfer of electrons (ionic bonds), Irving Langmuir refined G.N. Lewis's postulations by abandoning the stationary cubical arrangement of the octet. He introduced the term **covalent bond** to describe a new path to stability: sharing.

The Goal: A Stable Octet

Atoms combine by sharing valence electrons to achieve the outer-shell electron configuration of the nearest noble gas (typically eight electrons).

Forming the Chlorine Molecule (Cl_2)

Step-by-step formation of a single covalent bond

Each combining chlorine atom contributes exactly one electron to the shared pair.



By sharing a single pair, both atoms effectively trick themselves into holding a complete outer shell of 8 electrons, successfully attaining the Argon configuration.

Translating Dots to Structural Lines

The equivalence of the single covalent bond.



The Single Covalent Bond

When two atoms share one electron pair (2 electrons total), they are joined by a **single covalent bond**. One line always represents exactly two shared electrons.



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

Practice Now



At prep.topall.app

Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



Multiple Bonds: The Double Bond

Sharing more to meet the octet requirement.



Why Double Up?

Sometimes sharing one pair isn't enough. In Carbon Dioxide (CO₂), the central carbon needs 4 electrons to reach an octet, and each oxygen needs 2. By sharing two pairs of electrons (4 electrons total) per connection, they form a double bond, perfectly solving the deficit for all three atoms.

Multiple Bonds: The Triple Bond

The highest order of standard covalent sharing

Nitrogen Gas (N_2)

Nitrogen atoms have 5 valence electrons. They must share **three** pairs (6 electrons total) to achieve a stable octet, forming a triple bond.



Ethyne (C_2H_2)

Carbon atoms can also form triple bonds with each other, sharing three pairs of electrons while simultaneously maintaining single bonds with Hydrogen atoms on the **periphery**.



Covalent Bonds Synthesis

A comparative matrix of shared electron pairs.

Bond Type	Shared Pairs	Total Shared Electrons	Notation	Examples
Single Bond	1 Pair	2 Electrons	A — B	Cl ₂ , H ₂
Double Bond	2 Pairs	4 Electrons	A = B	CO ₂ , C ₂ H ₄
Triple Bond	3 Pairs	6 Electrons	A ≡ B	N ₂ , C ₂ H ₂

 Screenshot this frame. Remember the cardinal rule: Every individual line drawn in a chemical structure represents **exactly two** shared electrons working together to complete the stable octet.



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

That's exactly what TopAll Pro is built for.

Try TopAll Pro Now

What TopAll Pro Does Differently

-  **Stuck? Snap it. Solve it. — Doubts AI**
Photo → step-by-step solution in seconds, 24/7
-  **Your AI Coach finds your blind spots**
Concept-level weakness detection — not just chapter-level
-  **4.5 Lakh+ questions. Never run out.**
13× more content than any other prep app in India
-  **Build your own test in 60 seconds**
Pick a chapter, set difficulty — AI does the rest instantly.
-  **AI Recommendation that helps you improve**
AI Recommendation Analysis your Tests and tell you where you need to improve.



Practice the moment you finish studying
Jump in while the concept is still fresh in your head

4.5L+
MCQs

1.5L+
Students

AI Powered
In-Depth Analysis