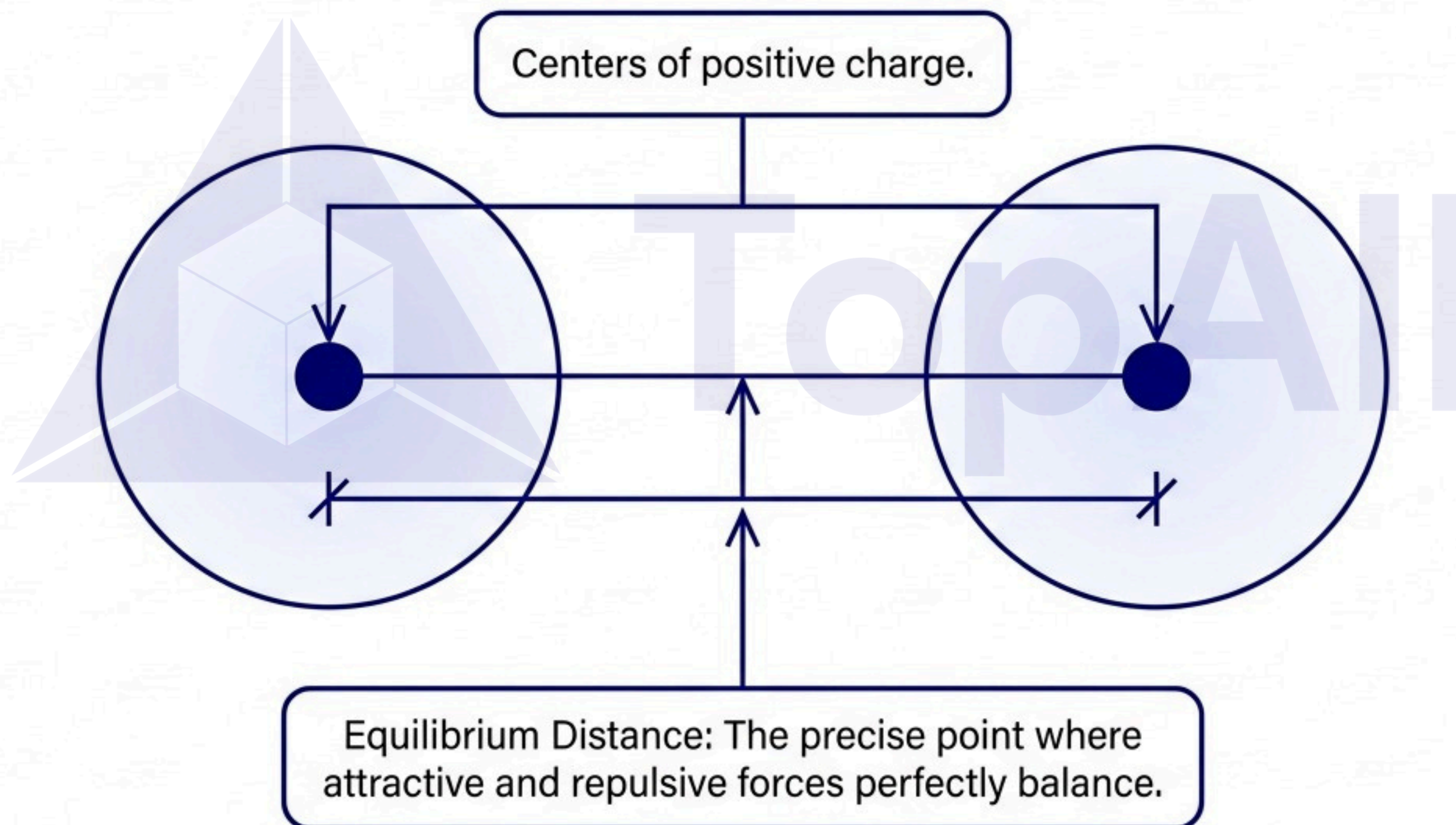


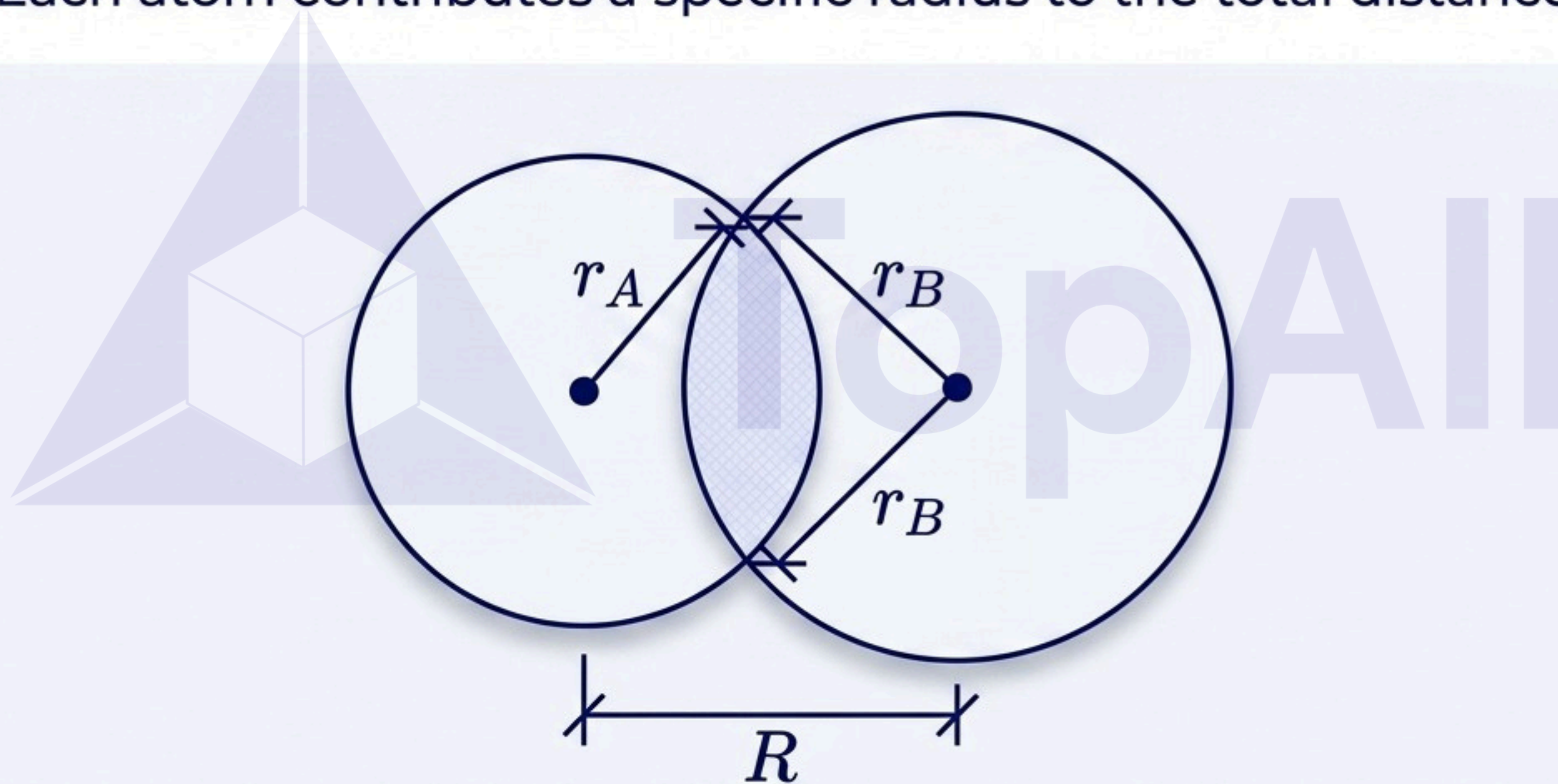
DEFINING BOND LENGTH

The physical equilibrium distance between atoms.



The Anatomy of a Bond

Each atom contributes a specific radius to the total distance.





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



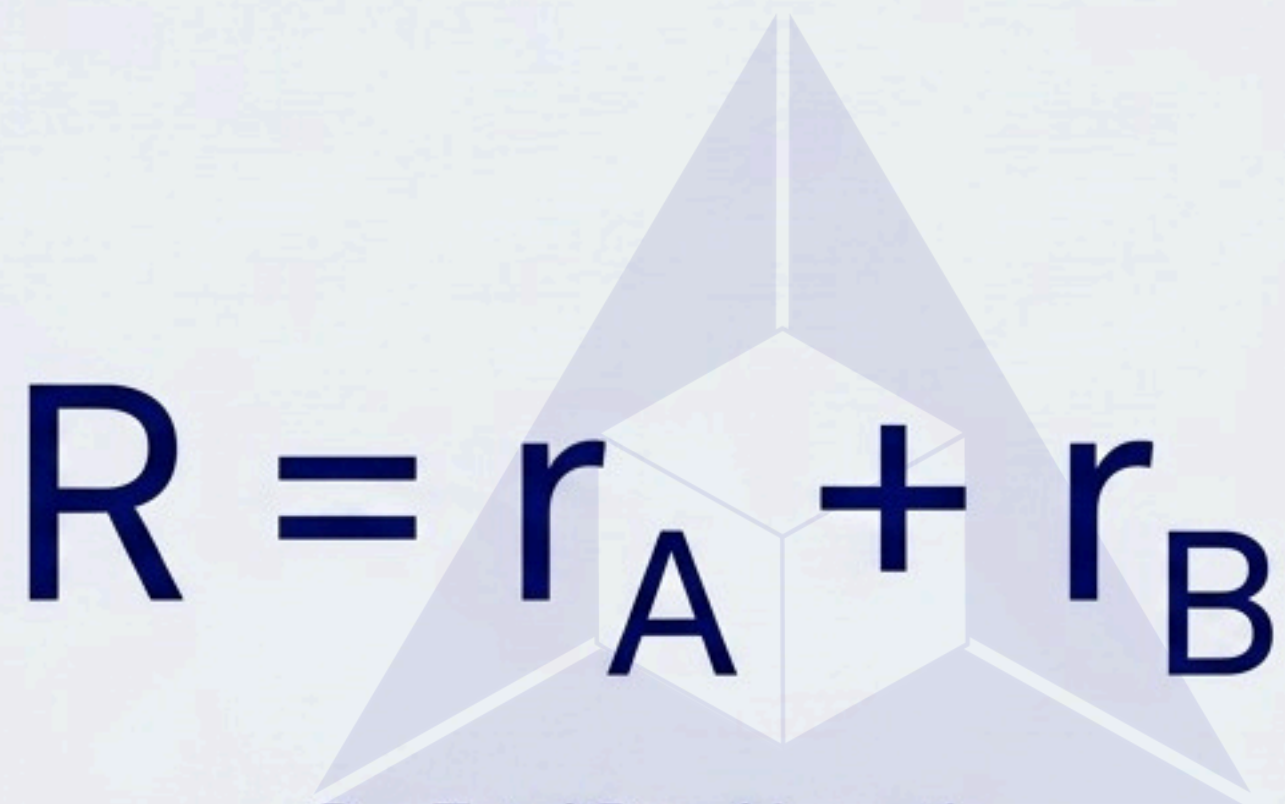
At prep.topall.app

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



The Additive Principle



R = Total Bond Length

r_A, r_B = Covalent Radii of the contributing atoms.

Carbon
($r_c = 77$ pm)

+

Hydrogen
($r_c = 37$ pm)

=

C-H bond
(114 pm approx)*

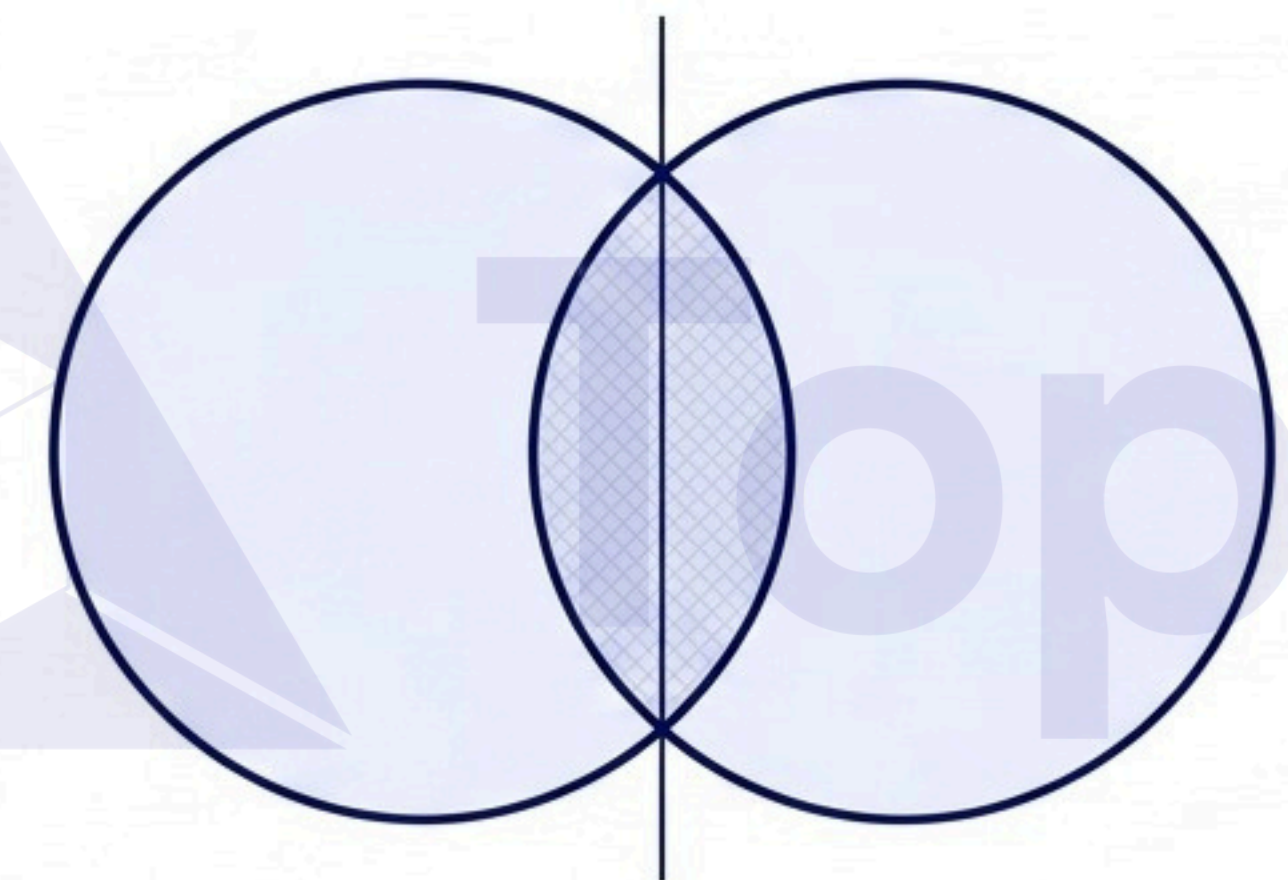
*Note: Source data indicates the actual C-H bond length is 107 pm. Average covalent radii do not always perfectly add up due to electronegativity differences, but they establish the fundamental structural model.

Covalent Radius (r_c)

Measuring atoms in a bonded state.

Definition:

The radius of an atom's core when in direct contact with the core of an adjacent atom in a bonded situation.



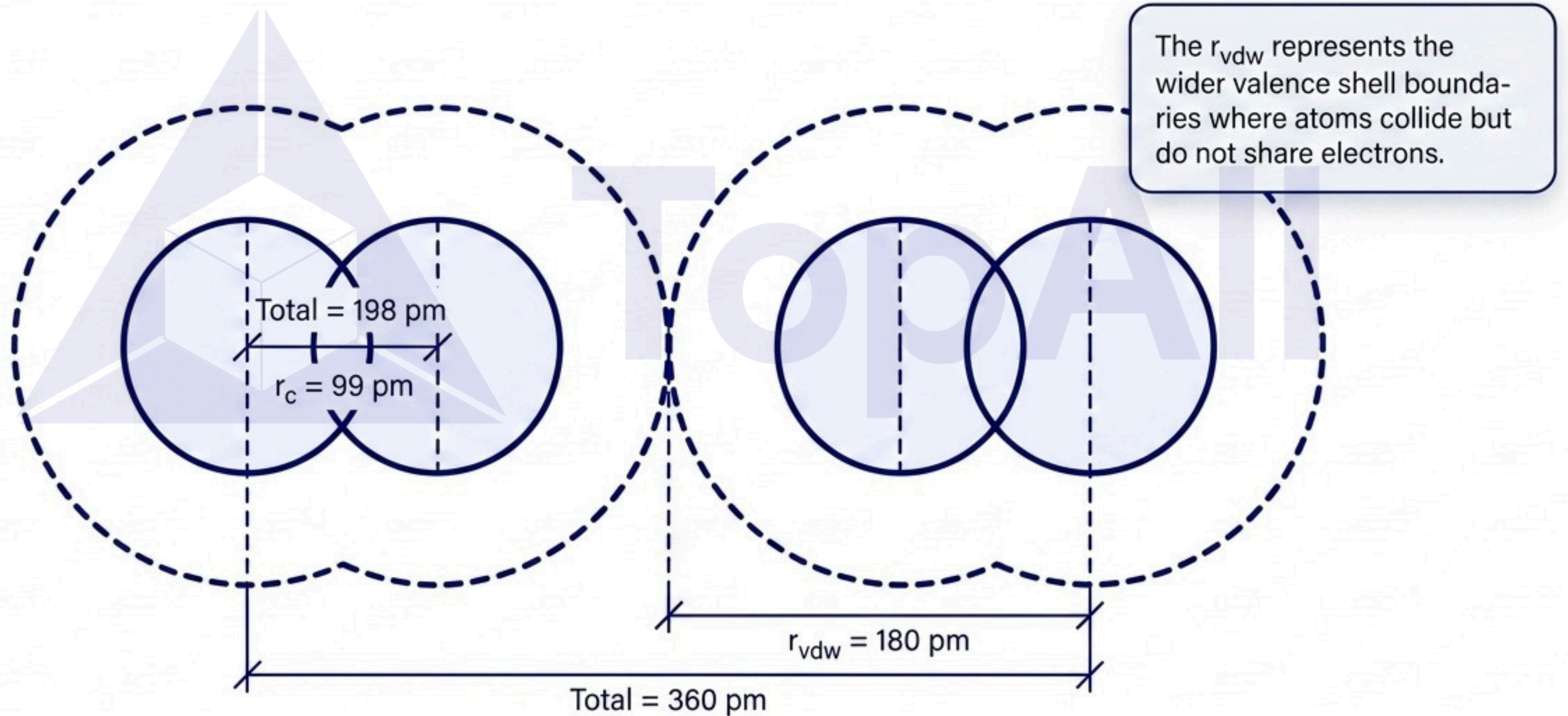
Calculation:

Exactly half the distance between two similar atoms joined by a single covalent bond in the same molecule.

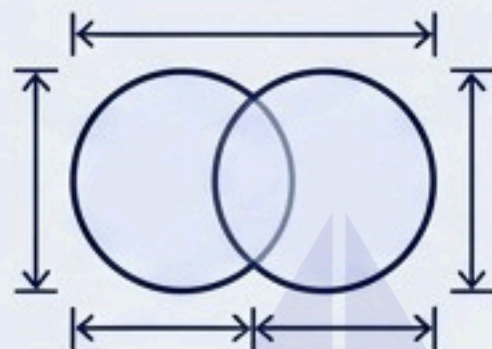
$$r_c = R / 2$$

van der Waals Radius (r_{vdw})

Measuring the overall size of an atom in a nonbonded solid state

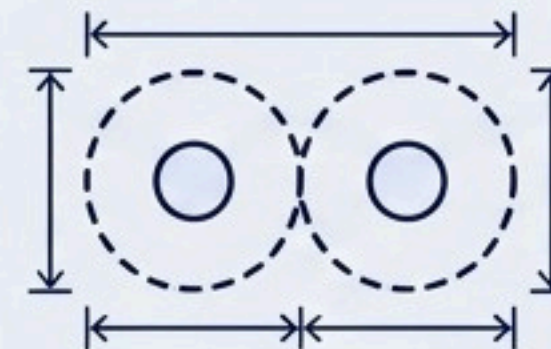


Revision Frame: Atomic Radii



Covalent Radius (r_c)

- ✓ **State:** Bonded (Overlapping)
- ✓ **Definition:** Half the distance between nuclei of two identical bonded atoms.
- ✓ **Measures:** The atomic core in a shared electron state.
- ✓ **Size:** Always smaller than r_{vdw} (e.g., Chlorine = 99 pm).



van der Waals Radius (r_{vdw})

- ✓ **State:** Nonbonded (Touching in solid state)
- ✓ **Definition:** Half the distance between nuclei of two similar adjacent atoms in separate molecules.
- ✓ **Measures:** The overall size and valence shell boundary.
- ✓ **Size:** Always larger than r_c (e.g., Chlorine = 180 pm).



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