

UNIT 8 • ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

Structure of the Carbonyl Group

The Blueprint Legend

[sp^2 Hybridisation]

Forms the flat, 3-point skeletal framework.

[Sigma (σ) / Pi (π) Bonds]

σ = the rigid skeleton; π = the reactive electron cloud.

[Electrophilic / Nucleophilic]

Electron-seeking (+) vs.
Electron-donating (-).



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

$$E=mc^2$$



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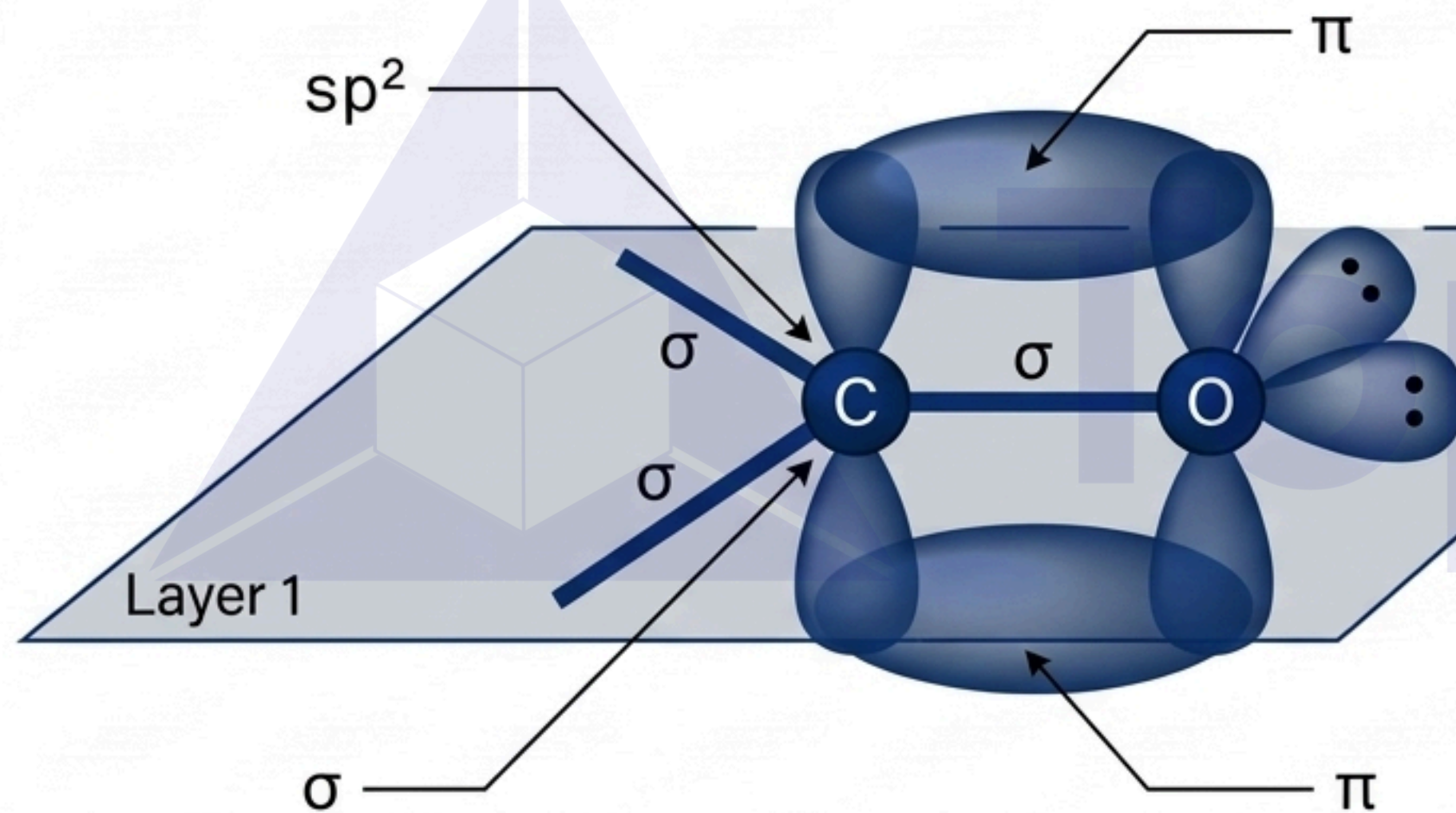
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Key Highlights

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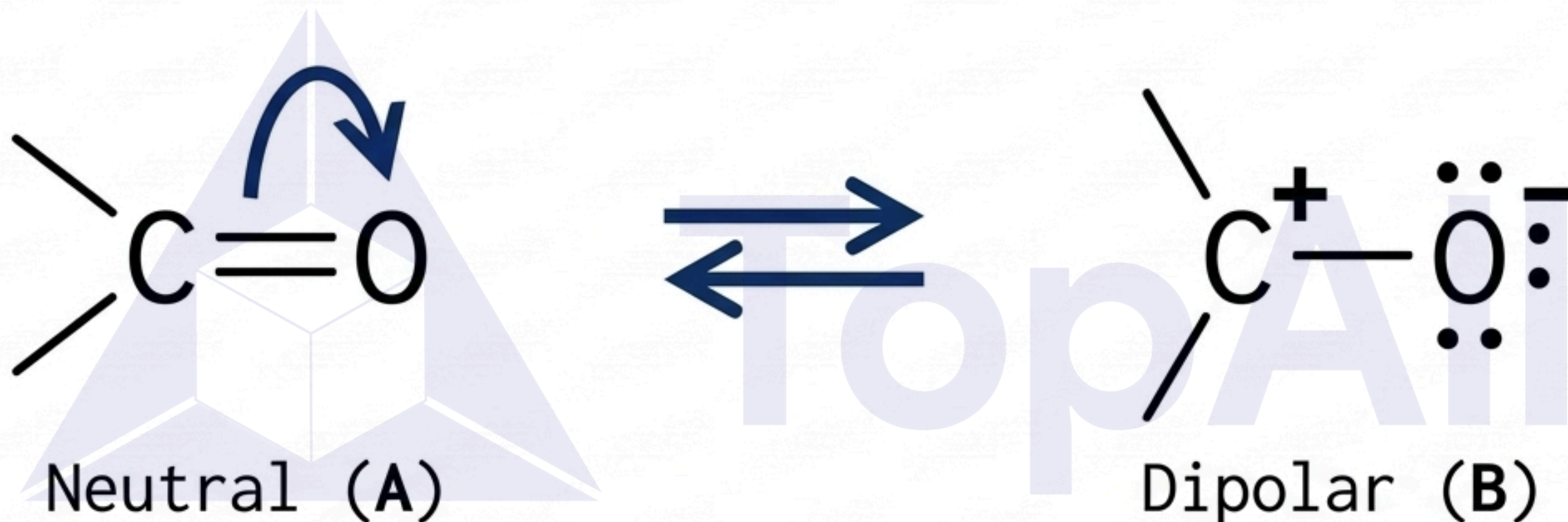


Architectural Schematic: The Carbonyl Core



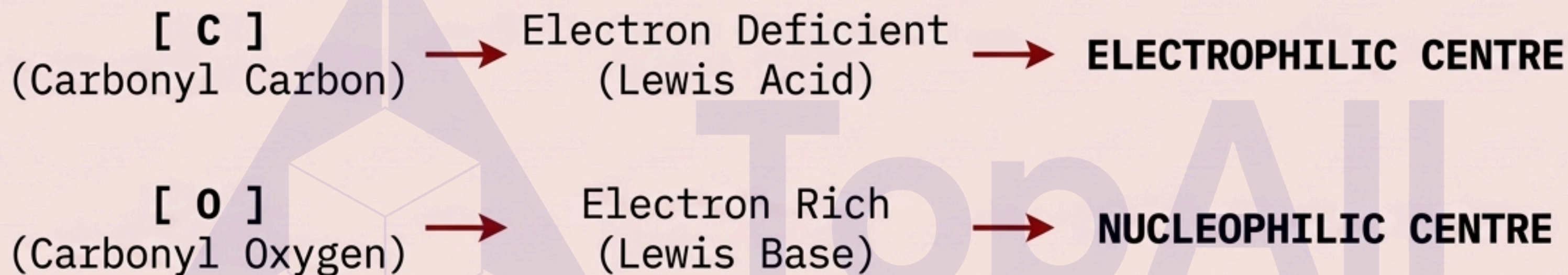
Formula Bank:
Bond angles $\approx 120^\circ$
(Trigonal Coplanar)

The Dynamic State: Resonance & Polarity



Oxygen's higher electronegativity pulls the π -cloud, giving carbonyls substantial dipole moments (highly polar compared to ethers).

JEE/NEET Trap Alert: Watch for this common swap



Examiners frequently test this by reversing the roles in multi-statement questions. Always remember: Oxygen hoards the electrons, making Carbon the target for nucleophilic attack.

Key Takeaways: Structure & Reactivity

- The carbonyl carbon is sp^2 hybridised, forming a **rigid trigonal coplanar skeleton** with bond angles of $\approx 120^\circ$.
- **Electronegativity mismatch** creates **resonance** between neutral and dipolar structures, making the **Carbon electrophilic** and the **Oxygen nucleophilic**.



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