

Switchable Chemistry for Smarter Chips

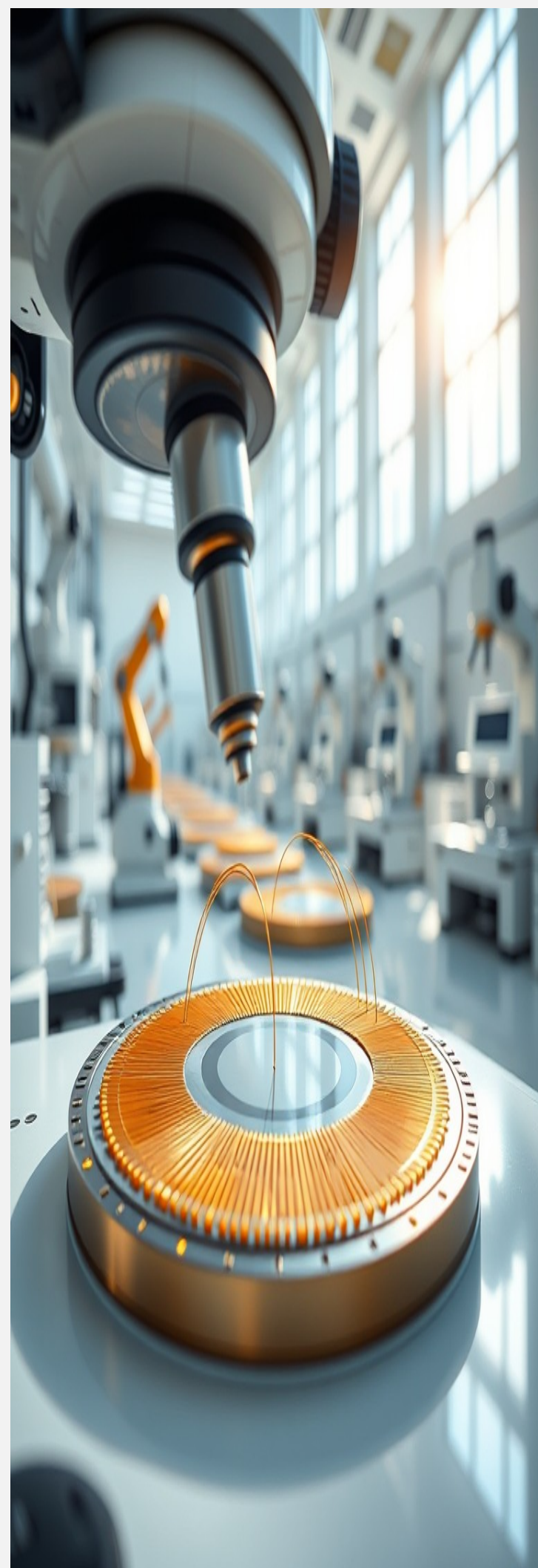
A breakthrough in radical reactions enables precise control over polymer and semiconductor synthesis.

Dual-copper relay catalytic strategy

Catalytic Innovation

This new method allows for reversible switching between two key reaction pathways—ATRA and ATRP—using a single catalytic system.

The research introduces a dinuclear copper complex that selectively activates strong C–Cl bonds in unactivated alkyl chlorides, while a mononuclear partner enables controlled C–Cl bond reconstruction. This switchable platform enables precise, on-demand synthesis of functionalized molecules and polymers critical for next-gen semiconductor materials.



01

C-Cl Bonds: From Obstacle to Tool

The ability to activate and reconstruct these bonds under mild conditions opens doors for creating high-performance, durable materials without the need for harsh reagents or high-energy processes, reducing defect rates and improving yield in advanced chip manufacturing.



02

Radical Control, Not Just Speed

This level of control could allow for dynamic, in-situ tuning of material properties during fabrication—such as switching from chain growth to functional end-group attachment—offering unprecedented flexibility in designing multi-functional semiconductor components and advanced packaging substrates.

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