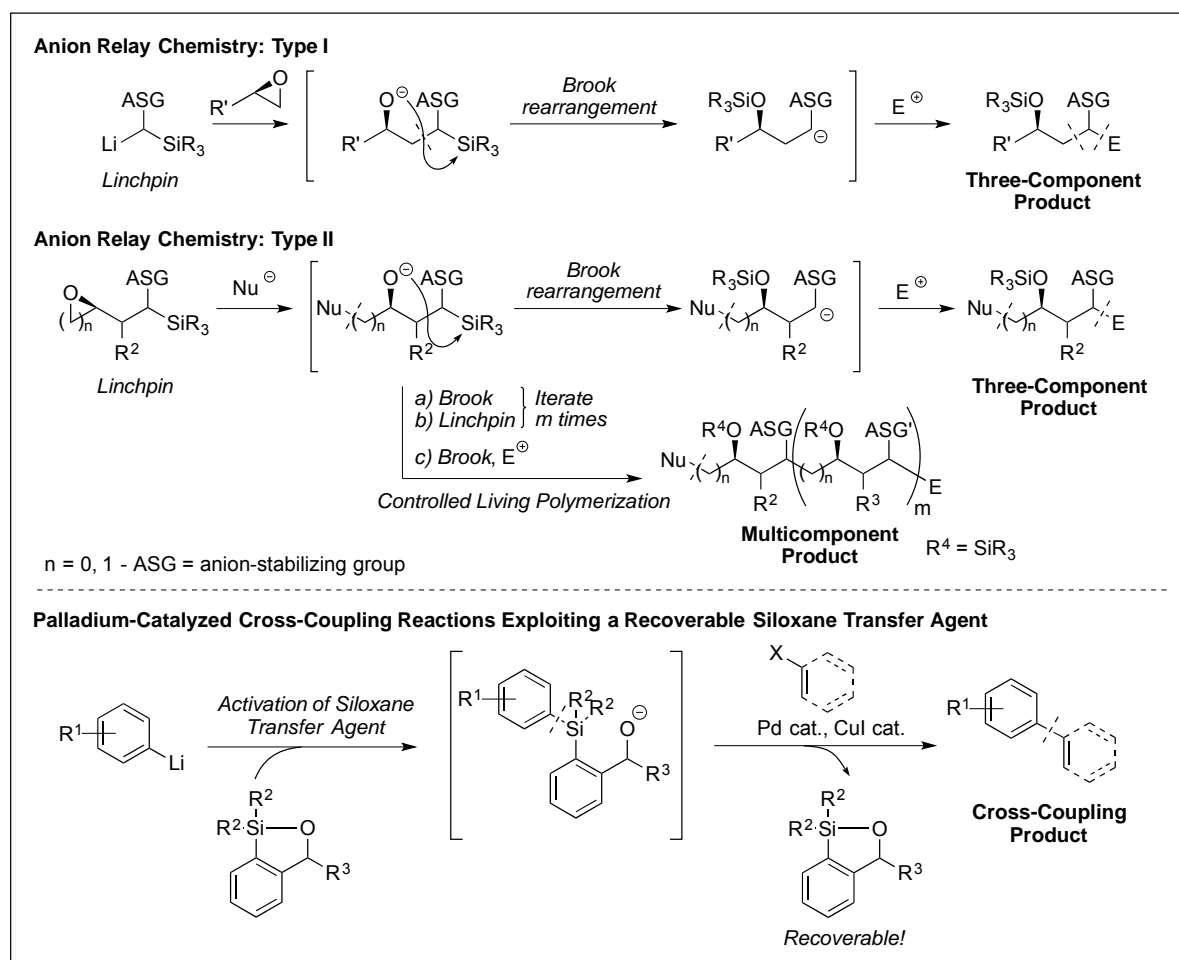


# Evolution and Exploitation of Anion Relay Chemistry (ARC)

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Anion Relay Chemistry (ARC), a robust multi-component synthetic tactic, permits rapid construction of complex natural and “natural-like” molecules for biomedical applications. By exploiting various anion-relocation strategies (i.e., [1,n]-Brook Rearrangements), the controlled, sequential assembly of architecturally diverse structures can be achieved by virtue of the latent nucleophilicity of the designed bifunctional ARC linchpins, thus comprising a reaction sequence not dissimilar to “living polymerization.” Importantly, the iterative ARC protocol can be carried out in a “single flask!”



Recent integration of Anion Relay Chemistry (ARC) with the Takeda and Hiyama reactions has revealed a “new ARC dimension,” namely the viability of efficient palladium-catalyzed cross-coupling reactions of aryl organolithium agents with aryl and vinyl halides, that permits near quantitative recovery of the siloxane-based transfer agent. This tactic offers a practical protocol to circumvent undesired processes, such as lithium–halogen exchange leading to homocoupling, to say nothing of the heavy metal waste streams observed in cross-coupling reactions.

Attachment of the siloxane-transfer agent to a reusable polymer has also been achieved, permitting high-yield cross-coupling reactions.