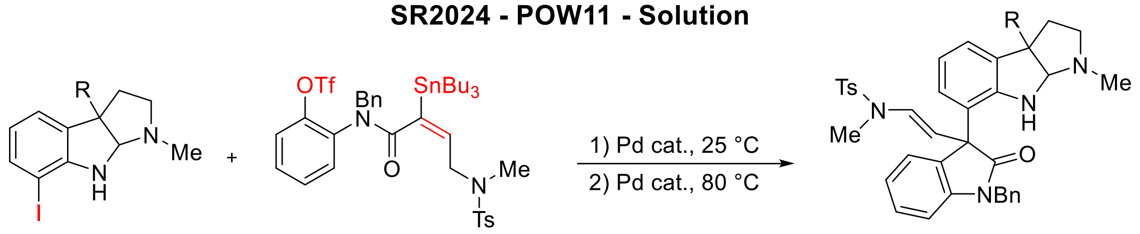
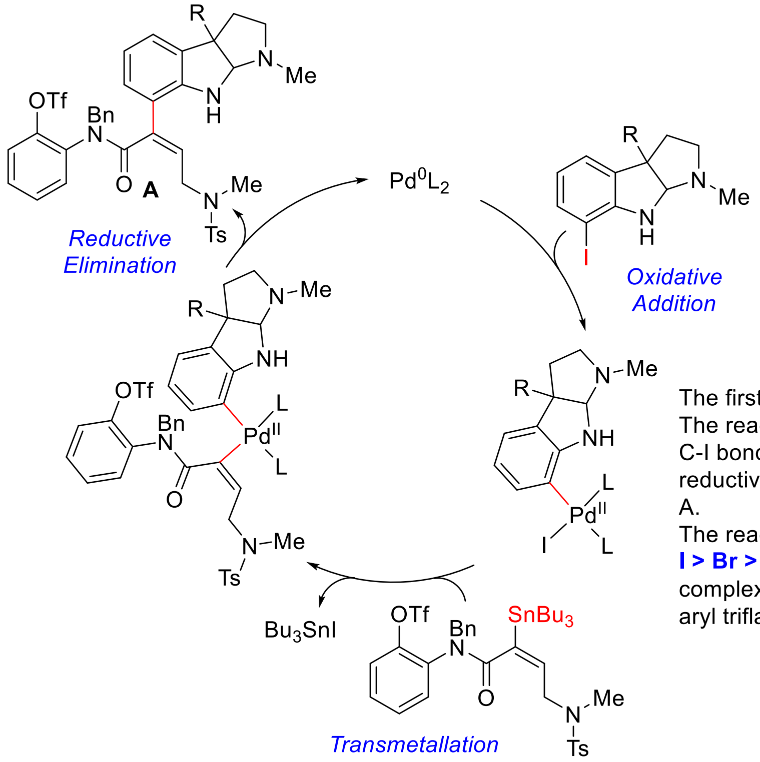
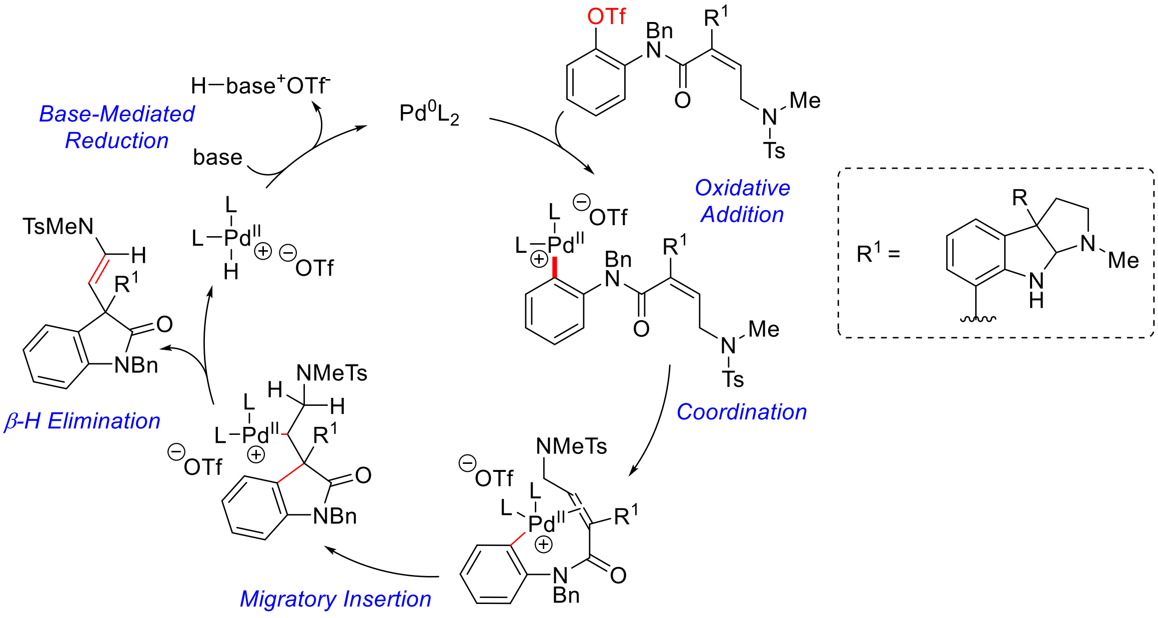
SR2024 - POW11 - Solution





The first step is an intermolecular **Stille**-coupling. The reaction begins with the oxidative addition of the C-I bond. After transmetalation of the stannane, reductive elimination gives the C-C coupling product A.

The reaction rate for oxidative addition is as follows: **I > Br > OTf > Cl**. Therefore the palladium(0)-complex reacts first with the aryl iodide and not the aryl triflate.



The second step of the reaction is a **Heck**-reaction. The reaction starts again with an oxidative addition of the triflate. Triflates are only weakly coordinating to the Pd and therefore a cationic intermediate arises and the olefin coordinatively saturates the palladium. After olefin insertion, beta-hydride elimination gives the product with the more stable trans-double bond and a palladium hydride complex. In presence of base, the palladium hydride is reduced back to Pd(0) to close the catalytic cycle.